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ABSTRACT

Six studies were conducted to detect changes in nutrition-related knowledge, attitudes, and behaviors of educators and food service personnel in schools and child care facilities participating in the Texas Nutrition Education and Training Program. The KABINS model was used to identify indicators of program effectiveness, assuming that changes in knowledge lead to changes in attitudes that result in altered behaviors, and ultimately result in improved nutritional status. Results showed that single, four to eight hour workshops were effective in changing participants' knowledge and attitudes but had minimal effects on their nutrition education and menu planning practices. Efforts to publicize availability of the program's lending library collection were successful in doubling its use. Materials distributed through the program were used at rates that matched the program's goals. Two areas were identified as strategic targets for program improvement: intensifying efforts to help child care personnel plan better menus and increasing support for nutrition education in public schools. Extensive appendices include an evaluation of workshops; survey of workshop participants versus nonparticipants; effects of training on day care center menus; reasons for nonparticipation in workshops; use of the lending library collection; and use of training materials. (GDC)

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FINAL EVALUATION REPORT

Texas Nutrition Education and Training Program

October 1984 through September 1985

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
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Prepared April 1986
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EVALUATION REPORT

APPLYING THE KABINS MODEL TO EVALUATE THE TEXAS NUTRITION EDUCATION AND TRAINING PROGRAM

OCTOBER 1984 THROUGH SEPTEMBER 1985

EXECUTIVE SUMMARY

TEXAS NUTRITION EDUCATION AND TRAINING (NET) PROGRAM ACTIVITIES HAVE BEEN EFFECTIVE IN CHANGING NUTRITION-RELATED KNOWLEDGE, ATTITUDES, AND BEHAVIORS OF EDUCATORS AND FOOD SERVICE PERSONNEL IN CHILD CARE FACILITIES AND PRIVATE SCHOOLS.

ACTIVITIES EVALUATED	INDICATORS MONITORED		
	KNOWLEDGE	ATTITUDES	BEHAVIOR
WORKSHOPS:			
NUTRITION & THE PRESCHOOL CHILD	+ +	+ +	+
FOOD...EARLY CHOICES	+	+ +	+
MENU PLANNING & KITCHEN ECONOMY	+ +	+ +	0
KITCHEN MATH & FOOD PURCHASING	+	+	
LENDING LIBRARY COLLECTION:			
PUBLICITY IN JOURNAL ARTICLES			+
WORKSHOP COVERAGE	+ +	+ +	0
DISTRIBUTION OF MEDIA CATALOG			+ +
NUTRITION EDUCATION & FOOD SERVICE MATERIALS:			
ECONOMY IN THE KITCHEN			+
MORE THAN GRAHAM CRACKERS			+ +
KIM SERIES--FOOD IS GOOD			+
THE VERY HUNGRY CATERPILLAR			+ +

KEY: + + = IDEAL + = ACCEPTABLE 0 = NEEDS IMPROVEMENT

EXECUTIVE SUMMARY

Texas Nutrition Education and Training (NET) program activities have been effective in changing nutrition-related knowledge, attitudes, and behaviors of educators and food service personnel in child care facilities and private schools. NET is a federally funded program whose goal is to assure that the nation's children are provided with opportunities to learn about and to practice good eating habits. The Texas NET staff develop and conduct workshops, maintain a lending library collection, acquire and distribute nutrition education and food service management materials, and provide other services to foster nutrition education and effective food service management in child care facilities and schools.

During 1985, six evaluation studies were conducted to determine the effectiveness of program activities to date and to identify areas for improvement. Different methods (e.g., time-series analysis, group comparisons, criterion references) were used to assess status on different indicators of program effectiveness.

Curricula of the **Nutrition and the Preschool Child** and the **Menu Planning and Kitchen Economy** workshops performed well in helping participants master knowledge and attitude objectives. Curricula in the **Food...Early Choices** and **Kitchen Math and Food Purchasing** workshops prompted changes in the right direction, but the changes were not always statistically significant.

The pattern of nutrition education behavior in centers that had participated in the **Nutrition and the Preschool Child** workshop more often approximated the ideal than did the pattern in centers that had not, but there were areas for improvement. The curriculum of the **Food...Early Choices** workshops successfully encouraged use of the nutrition education kit distributed to centers that participated in the workshop. During the two months after the workshops, the kit was used at least a few times by the majority of centers that received it. The **Menu Planning and Kitchen Economy** workshop had no effect on menus actually used in day care centers. The pattern of strengths and weaknesses in nutrient content and sensory appeal of the menus was the same, irrespective of workshop participation.

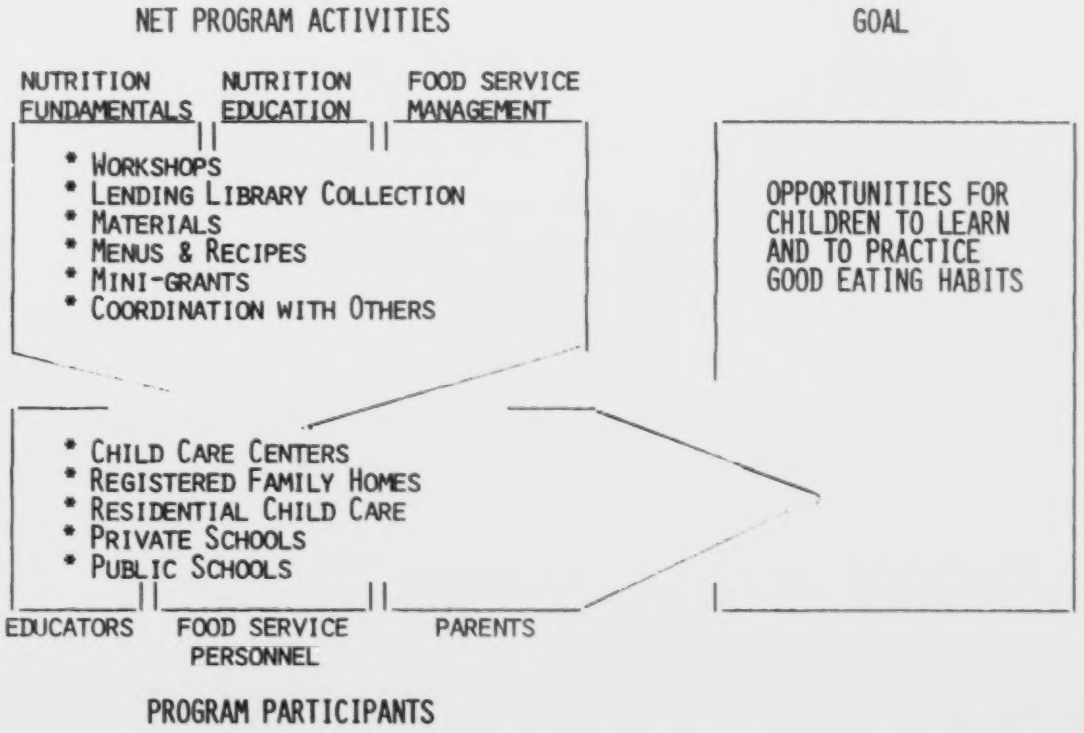
Workshop trainers identified lack of knowledge about the workshops as a major barrier to workshop participation. Steps were taken during 1985 to provide more information to a larger audience. Participation rates increased slightly from 1,950 in 1984 to 2,075 in 1985 with most of the participants being staff of child care facilities.

Borrowing rates for the NET lending library collection increased dramatically during 1985. Most of the gain was attributed to distribution of volume I of the NET media catalog. Some of the materials surveyed during 1985 were being used at rates that exceeded preset criteria for goal attainment.

Intensifying efforts to help day care center staff plan better menus and adjusting program activities to increase support for nutrition education and training in public schools emerged as strategic targets for program improvement.

BACKGROUND

THE GOAL OF THE FEDERALLY FUNDED NET PROGRAM IS TO ASSURE THAT CHILDREN HAVE OPPORTUNITIES TO LEARN ABOUT AND TO PRACTICE GOOD EATING HABITS.



BACKGROUND

The goal of the federally funded NET program is to assure that children have opportunities to learn about and to practice good eating habits. The program was established in 1977 (public law 95-166) to provide grants to states to:

- encourage good eating habits and teach children the relationship between food and health,
- train food service personnel in nutrition and food service management,
- instruct educators in the fundamentals of nutrition and how to convey this information so as to motivate children to eat right, and
- develop appropriate educational materials and curricula.

The Texas Department of Human Services (DHS) became active in the NET program in 1979, receiving a grant from the Texas Education Agency (TEA) to expand the public-school-based program into child care facilities. In 1982, when federal funding was cut substantially, TEA relinquished participation in the program and DHS assumed responsibility for Texas NET activities.

Staff of the Texas NET program develop and conduct workshops, provide lending library services, acquire and distribute nutrition education and food service management materials, develop cycle menus and standardized recipes, award mini-grants to public schools, and coordinate with other associations and programs interested in promoting nutrition learning.

These services are provided free of charge to staff of child care facilities, registered family homes, and schools participating in other federal child nutrition programs. During 1985, a needs assessment was conducted in public schools. Results of the needs assessment are being used to enhance activities that support nutrition education and food service management practices in public schools.

PURPOSE

A FORMAL EVALUATION WAS INITIATED IN OCTOBER 1984 TO HELP MAKE THE TEXAS NET PROGRAM AS EFFECTIVE AS POSSIBLE.

OBJECTIVES:

* TO DETERMINE EFFECTIVENESS OF PROGRAM ACTIVITIES TO DATE,
* TO IDENTIFY AREAS WHERE IMPROVEMENTS ARE NEEDED IN CURRENT ACTIVITIES, AND
* TO IDENTIFY REASONS FOR NONPARTICIPATION.

PURPOSE

A formal evaluation was initiated in October 1984 to help make the Texas NET program as effective as possible. Although the U.S. Department of Agriculture's (USDA) NET regulations require states to evaluate their programs' effectiveness, the General Accounting Office (GAO) in 1982 published a report citing the infrequent occurrence of NET program evaluations. Texas was one of the five states included in the survey sample on which the GAO report was based.

Authors of the GAO report recommended that USDA provide states with guidelines on how to specify program objectives and how to measure changes in program participants' knowledge, attitudes, and behavior. The GAO report indicated that the evaluation should provide management information needed to:

- effectively administer the program,
- guide program revisions and planning,
- ensure that federal funds are spent effectively, and
- provide information to USDA to submit to Congress so it can apportion scarce resources.

Evaluation guidelines provided in two USDA publications (**The Idea Book: Sharing Nutrition Education Experiences, 1981**; and **A Guide to Evaluation in the Expanded Food and Nutrition Education Program, 1983**) were followed in conducting the evaluation of the Texas NET program. Objectives of the evaluation were to:

- determine effectiveness of program activities to date,
- identify areas where improvements are needed, and
- identify reasons for nonparticipation.

PROCEDURES

THE KABINS MODEL RECOMMENDED BY THE U.S. DEPARTMENT OF AGRICULTURE WAS APPLIED TO IDENTIFY INDICATORS OF EFFECTIVENESS FOR 1984-85.

KNOWLEDGE:

* EDUCATORS & FOOD SERVICE STAFF UNDERSTAND PRINCIPLES OF FOOD, NUTRITION, AND HEALTH

* EDUCATORS & FOOD SERVICE STAFF KNOW HOW TO PROVIDE CHILDREN WITH OPPORTUNITIES TO LEARN & TO PRACTICE GOOD EATING HABITS
  - EDUCATORS KNOW HOW TO CONDUCT NUTRITION LEARNING ACTIVITIES
  - FOOD SERVICE STAFF KNOW HOW TO PRACTICE SOUND FOOD SERVICE MANAGEMENT

ATTITUDES:

* EDUCATORS & FOOD SERVICE STAFF BELIEVE THAT THEY SHOULD TAKE AN ACTIVE ROLE IN SHAPING CHILDREN'S EATING HABITS

BEHAVIOR:

* EDUCATORS & FOOD SERVICE STAFF PROVIDE CHILDREN WITH OPPORTUNITIES TO LEARN AND TO PRACTICE GOOD EATING HABITS
  - EDUCATORS CONDUCT NUTRITION LEARNING ACTIVITIES
  - FOOD SERVICE STAFF PLAN MENUS TO PROVIDE NUTRITIOUS & APPEALING MEALS

* EDUCATORS & FOOD SERVICE STAFF MAKE USE OF RESOURCES PROVIDED BY NET
  - THEY PARTICIPATE IN NET WORKSHOPS
  - THEY USE THE NET LENDING LIBRARY COLLECTION
  - THEY USE MATERIALS DISTRIBUTED TO THEM

PROCEDURES

The KABINS model recommended by USDA was applied to identify indicators of effectiveness for 1984-85. The KABINS model "assumes that changes in knowledge (K) lead to changes in attitudes (A) that result in altered behaviors (B) and ultimately result in improved nutritional status (INS)" (USDA, 1981).

Knowledge objectives were identified in each of three content areas suggested in the federal legislation. Program participants should come to understand the principles of food, nutrition, and health. Educators should know how to conduct nutrition learning activities for children in their classes. Food service personnel in child care facilities and schools should know how to practice sound food service management.

Attitude objectives were identified only in the latter two content areas. The program seeks to shape educators' attitudes toward nutrition education and food service personnel's attitudes toward food service for children.

Two kinds of behavioral objectives were identified. First, the program seeks to support behaviors that create opportunities for children to learn about and to practice good eating habits. Desired outcomes are that educators conduct effective nutrition learning activities for children in their classes and that food service staff produce menus that encourage children to practice good eating habits.

The second kind of behavioral objective reflects concern for ongoing nutrition learning. Desired outcomes are that educators and food service personnel seek current nutrition information and make use of NET resources to support their own nutrition education and food service practices. They should participate in NET workshops, use the NET lending library collection, and use materials distributed to them through the NET program.

DESIGN

DIFFERENT METHODS WERE USED TO ASSESS STATUS OF THE VARIOUS INDICATORS.

EVALUATION	DESIGN	INSTRUMENTS	DATA SOURCE	SAMPLE SIZE
EFFECT OF WORKSHOPS ON KNOWLEDGE & ATTITUDES	TIME-SERIES	KNOWLEDGE TEST & ATTITUDE SCALES	WORKSHOP PARTICIPANTS	20-50/WORKSHOP
NUTRITION EDUCATION CURRICULA IN DAY CARE CENTERS	COMPARISON GROUP	QUESTIONNAIRE	LICENSED DAY CARE CENTERS	17 WORKSHOP & 15 COMPARISON CENTERS
EFFECTS OF WORKSHOPS ON MENU PLANNING	TIME-SERIES W/ COMPARISON GROUP	COMPUTERIZED NUTRIENT ANALYSIS & VARIETY CHECKLIST	LICENSED, NON-PROFIT DAY CARE CENTERS	20 WORKSHOP & 20 COMPARISON CENTERS
REASONS FOR NON-PARTICIPATION	EXPERT PANEL	QUESTIONNAIRE	WORKSHOP TRAINERS	19 OF 20 TRAINERS
EFFECT OF PUBLICITY ON USE OF LIBRARY	TIME-SERIES & CROSS-TABS	USER FEEDBACK FORM	LIBRARY USERS	ALL FORMS OCT83 THRU JUN85
USE OF MATERIALS	SURVEY	QUESTIONNAIRE	WORKSHOP PARTICIPANTS	40/WORKSHOP

DESIGN

Different methods were used to assess status of the various indicators. The effect of workshops on nutrition knowledge was assessed using tests administered at the beginning, at the close, and approximately two months after workshops were conducted. The follow-up test was mailed to the first 100 participants whose social security number (SSN) ended in an odd number. Complete sets of test scores were obtained for 20 to 50 participants for each of 4 kinds of workshops. Attitude questionnaires were mailed approximately two months after workshops were conducted to the first 100 participants whose SSN ended in an even number. The questionnaires asked respondents to report their current attitudes and then indicate what their attitudes were before the workshop. This data collection procedure is referred to as a retrospective pretest or a then-posttest. Questionnaires were returned by 20 to 50 participants per type of workshop.

The status of nutrition education activities was surveyed in samples of licensed day care centers that had and had not participated in the **Nutrition and the Preschool Child** workshop. Survey questionnaires were mailed to all 46 of the centers that had participated in the workshops conducted January through March 1985 and to 50 centers selected at random from the population of eligible centers that had not participated in the workshops. Completed questionnaires were returned by 17 of the workshop centers and 15 of the comparison centers.

In order to determine what effects the **Menu Planning & Kitchen Economy** workshop had on menu planning behavior, day care center menus were collected for times 2 weeks before, 6 weeks after, and 12 weeks after workshops were conducted. Menus were requested from all centers participating in 8 of the 24 workshops conducted between January and July 1985 and from a random sample of eligible centers that had not participated. Complete sets of menus were supplied by 20 of the workshop and 20 of the comparison centers.

Barriers to workshop participation were identified by consulting workshop trainers for their expert opinions about reasons for nonparticipation. Nineteen of the 20 trainers returned completed questionnaires rating the importance and frequency of occurrence of 18 potential barriers.

Feedback forms circulated with items borrowed from the NET lending library provided data on use of the collection. The form asks the borrower to provide information about type of agency for which they work, what use they made of the material, and their evaluation of the material. Forms supplying information about items borrowed between October 1983 and June 1985 were used to complete time-series analyses of borrowing patterns in order to evaluate effects of efforts to publicize the collection.

In order to determine level of use of materials distributed through the NET program, questions about use of and suggested changes in materials were included at the end of the attitudes questionnaires mailed to workshop participants.

MEASUREMENT

DATA COLLECTION INSTRUMENTS WERE DEVELOPED AND ADJUSTED TO ENHANCE CONTENT VALIDITY AND MEASUREMENT RELIABILITY.

INSTRUMENT	CHECK ON VALIDITY	RELIABILITY
KNOWLEDGE TESTS	CONTENT CLASSIFICATION	.70
ATTITUDE SCALES	CONTENT CLASSIFICATION	.46
CURRICULUM QUESTIONNAIRE	EDUCATIONAL THEORY	UNKNOWN
MENU NUTRIENT ANALYSIS	USDA HANDBOOKS	
MENU VARIETY CHECKLIST	TEST TRIALS	UNKNOWN
PARTICIPATION QUESTIONNAIRE	IMPLEMENTATION THEORY	UNKNOWN
LIBRARY FEEDBACK FORM	CONVERGENT CRITERION	UNKNOWN
MATERIALS QUESTIONNAIRE	CONSISTENCY CRITERION	UNKNOWN

MEASUREMENT

Data collection instruments were developed and adjusted to enhance content validity and measurement reliability. The validity of the knowledge tests and attitude scales was checked in three ways. First, all items on the tests and scales were generated or reviewed by registered and licensed dietitians. Second, the items used to evaluate each workshop were cross-checked against a matrix model of the curriculum for that workshop. This procedure is referred to as content classification. Finally, the items were sorted into groups corresponding to the super-ordinate learning objectives for the different workshops. Adjustments were made as necessary to assure that the item sets were valid representations of workshop content.

Reliability coefficients for knowledge tests administered in three of the workshops were above .75. Reliability of the test used in the **Food...Early Choices** workshop and of attitude scales for each of the workshops were disappointing, ranging from .39 to .56. Possibilities for improving these instruments are being reviewed.

The reliability of data collection instruments used in other parts of this evaluation is unknown, although the validity of each has been checked. The content validity of the curriculum questionnaires was checked against educational theory. The computerized nutritional analysis of menus collected in day care centers was based on information in USDA handbooks on nutrients in foods. The validity of the menu variety checklist was assessed during trial applications of the checklist to menus clinically evaluated as good and poor. The development of the participation barriers questionnaire was guided by current theory in innovation acceptance and implementation.

The validity of the library users feedback form as a measure of actual use of materials in the collection was verified by comparing estimates of borrowing rates generated with information from the form with actual tallies developed by examining due date slips for a sample of items in the library. This comparison, called convergent criterion, showed that the feedback forms consistently underestimate actual borrowing by about 50 percent. Thus, the forms provide a valid but very conservative estimate of library use.

A serendipitous consistency criterion provided feedback about validity of the questionnaire items measuring use of materials distributed through the NET program. Responses indicated that satisfactory levels of use were being achieved for all materials except one booklet which the majority of respondents reported that their centers had never received. This response was very puzzling because the booklet is one that is enclosed in the workbook folder handed out to all participants during the workshop. When this puzzling finding was discussed with the workshop coordinator, it was discovered that supplies of the booklet had been exhausted shortly after the survey had begun and that, in fact, very few of the surveyed centers had received their copies. This unintended turn served to establish the validity of the survey form as a measure of level of use for the other materials.

Data Analysis

Data analysis strategies were matched to measurement strengths and limitations.

Evaluation	Analysis	Software Package
Effects of workshops on knowledge & attitudes	Single group repeated measures analysis of variance	SPSS-X
Nutrition education curricula in day care centers	Qualitative pattern matching	
Effects of workshops on menu planning	Between groups repeated measures analysis of variance	BMD
Reasons for non-participation in workshops	Multiple classification	
Effects of publicity on use of library	Gottman's procedure for time-series	SPSS-X
Use of materials	Criterion references	SPSS-X

DATA ANALYSIS

Data analysis strategies were matched to measurement strengths and limitations. Because knowledge tests and attitudes scales were returned in sufficient numbers to establish confidence that the sample was representative of the population of workshop participants for four of the six kinds of workshops, data generated with these tests and scales were submitted to SPSS-X procedures for repeated measures analysis of variance. These analyses tested statistical significance of observed changes in the nutrition-related knowledge and attitudes of workshop participants.

The questionnaire return rate in the survey of nutrition education curricula in day care centers was too small to satisfy assumptions about sample representativeness, so statistical procedures were not applied. However, the pattern of differences observed between workshop and comparison centers was useful in identifying areas where improvements can be made.

Although the samples of workshop and comparison centers participating in the menu analysis were small, the number of menu sets collected was large enough to allow statistical comparisons. Utility scores were computed for nutrient content and for sensory appeal of the menus. Utility scaling is a useful procedure for measuring variables with multiple attributes. Raw scores for each attribute are rescaled as percent of the range from the point that represents "horrible" or worst plausible raw score to the point that represents "ideal" or best raw score. By locating each attribute on the utility scale, the analyst is able to combine scores (i.e. aggregate across the attributes) to give each menu a single numerical score for nutrient content and one for sensory appeal. The utility scores were submitted to BMD procedures for between groups repeated measures analysis of variance. These procedures tested for the statistical significance of any apparent differences in menus before and after the workshop.

Multiple classification procedures were used to determine which of the potential reasons for non-participation were actual barriers to workshop participation. Importance ratings and occurrence estimates were crosstabulated to determine which of the barriers were judged to be both important and frequently occurring problems.

The effects that distribution of the NET media catalog had on use of the library were assessed using Gottman's procedure for analyzing time-series. In this procedure, the average and standard deviation were calculated for the 15 months before the catalog was published. The borrowing rates in each month after the catalog was published were compared against a criterion of the prior average plus two standard deviations. When the values for each of the subsequent months exceed this criterion, it is appropriate to attribute the change in borrowing rates to distribution of the catalog.

Before data were collected on use of materials distributed by the NET program, the program coordinator specified criteria for acceptable and ideal levels of use. Reported use was compared against these goals.

RESULTS

CHANGES IN NUTRITION-RELATED KNOWLEDGE, ATTITUDES, AND BEHAVIOR OCCURRED IN THE THREE CONTENT AREAS TARGETTED IN USDA GUIDELINES GOVERNING NET.

CONTENT AREA	INDICATORS MONITORED		
	KNOWLEDGE	ATTITUDES	BEHAVIORS
NUTRITION FUNDAMENTALS	+ +		+ (LIBRARY USE)
NUTRITION EDUCATION	+ +	+ +	+ (CURRICULUM)
FOOD SERVICE MANAGMENT	+	+	0 (MENUS)

KEY: + + = IDEAL + = ACCEPTABLE 0 = NEEDS IMPROVEMENT

RESULTS

Changes in nutrition-related knowledge, attitudes, and behavior occurred in all three content areas targetted in USDA guidelines governing NET. Workshops facilitated mastery of knowledge objectives in nutrition fundamentals, nutrition education, and food service management. They also were successful in shaping more positive attitudes toward nutrition education and food service management. Approximately 1,250 educators and 250 food service personnel from eligible child care centers and more than 100 other individuals participated in workshops conducted between January and June 1985.

The pattern of nutrition education activities in centers that had participated in the **Nutrition and the Preschool Child** workshop more nearly matched the ideal than did the pattern in centers that had not participated in the workshop. Notable differences between groups were in use of recommended instructional resources. Centers that had participated in the workshops more often used the recommended preschool nutrition curriculum and involved their food service staff in nutrition learning activities for the children. The survey of materials use complemented this assessment of nutrition education behavior in child care centers. Materials to support nutrition learning activities for children were being used at levels that were acceptable and sometimes ideal when measured against preestablished goals.

There was no detectable change in menu planning behavior in centers that participated in the **Menu Planning and Kitchen Economy** workshop. The pattern of menu strengths and weaknesses was the same, irrespective of workshop participation. Even though there were areas where menus needed improvement, there were no differences in nutrient content or sensory appeal of the menus for times before and after the workshop or between workshop and comparison centers.

Library publicity increased the use of nutrition-related materials in the NET lending library collection. The number of audio-visual materials borrowed increased from an average of 5 per month to 30 per month after publication of the audio-visual catalog. The number of borrowers rose from an average of 6 per month to 25 per month. Between October 1984 and October 1985, the library materials reached at least 100 educators and 75 food service personnel in child care centers, 85 teachers and 350 food service personnel in public schools, and 5 teachers in private schools.

EFFECTS OF NET WORKSHOPS ON KNOWLEDGE AND ATTITUDES

Scores on knowledge tests and attitude scales were higher after workshops than they were before in most of the content areas covered by the workshop curricula. The percent correct response on knowledge tests rose from an average of 58 before to 79 after the workshop. This change was substantial and reliable and brought scores up above the preestablished mastery criterion of 70 percent correct. Attitudes toward nutrition education and food service management were already positive before the workshop. Nonetheless, in all four of the workshops evaluated in this study there were gains on the attitude scales. These changes, though small, were statistically significant for three of the workshops.

One of the most interesting results of comparing knowledge test scores before and after workshops was the finding that knowledge improved during the two months between the close of the workshops and administration of the follow-up test. These gains were in content areas in which mastery is dependent on operational knowledge. Nutrition fundamentals is a content area whose mastery requires more factual than operational knowledge. Factual knowledge can decay over time unless it is reinforced with additional training. Performance in this content area did, in fact, slip slightly from an average of 78 at the close of the workshop to 76 at the two-month follow-up. Knowledge about nutrition education and food service management is operational knowledge, and operational knowledge is enhanced by practice. If educators and food service personnel use the nutrition education and food service management concepts taught in the workshops, they will discover more about those concepts and their knowledge will improve. The gain in knowledge scores during the two months after the workshops was in these two content areas. Average percent correct response rose from 71 at the close of the workshop to 78 at the two-month follow-up.

More detail about procedures and results of this study are included in the evaluation report entitled **Performance of Nutrition Education and Training (NET) Workshops: January through July 1985** included as Attachment A to this summary report.

NUTRITION EDUCATION IN DAY CARE CENTERS

Using the recommended curriculum and involving food service staff in learning activities for the children were strengths of nutrition education behavior in day care centers that had participated in the **Nutrition and the Preschool Child** workshop. One or more hours had been spent on nutrition education activities in 94 percent of the workshop centers and in 80 percent of the comparison centers. There were no differences between workshop and comparison groups in the amount of learning time allocated. The average was five hours per classroom. Classroom instruction on the relationship between food and health was the topic most often included in the nutrition curricula in both groups of centers (100 and 92 percent of the workshop and comparison centers, respectively). Use of the NET lending library collection was infrequent. Only 12 percent of the workshop centers and none of the comparison centers reported using the library collection.

Because there was no way to assure that there were no prior differences in the groups of workshop and comparison centers and because the number of centers that returned completed questionnaires was small (17 workshop centers and 15 comparison centers), it was not possible to determine conclusively what effects the workshop had on participant behavior. However, the pattern of differences between workshop and comparison centers was useful in diagnosing areas where improvements can be made.

The ideal pattern would show a large number of hours spent on nutrition education, balanced coverage of all three of the specified content areas, and use of all three of the specified instructional resources. The pattern observed in the group of workshop participants was closer to the ideal than was the pattern in the comparison group. Eight of the workshop centers and none of the comparison centers matched the ideal on as many as five of the seven attributes in this model of effective nutrition education. One of the workshop centers matched the pattern exactly: in that center a greater than average amount of time (seven hours) was devoted to nutrition education, all three of the specified topic areas were covered, and all three of the recommended resources were used.

These results suggest that the curriculum of the **Nutrition and the Preschool Child** workshop is promoting effective nutrition education in preschool classrooms. However, the effects are not dramatic and there clearly is room for improvement, particularly in promoting use of the NET lending library collection and use of the preschool nutrition curriculum recommended in the workshop.

More detail about procedures and findings of this study are included in the evaluation report entitled **Survey of Nutrition Education Activities: March to September 1985** included as Attachment B to this summary report.

UTILITY SCORES FOR NUTRIENT CONTENT AND FOR SENSORY APPEAL WERE THE SAME IRRESPECTIVE OF PARTICIPATION IN THE MENU PLANNING AND KITCHEN ECONOMY WORKSHOP.

AVERAGE UTILITY SCORES

	WORKSHOP PARTICIPANTS			NON-PARTICIPANTS		
		6 WEEKS	12 WEEKS		6 WEEKS	12 WEEKS
SCALE	BEFORE	AFTER	AFTER	BEFORE	AFTER	AFTER
NUTRIENT CONTENT	78	79	80	80	81	80
SENSORY APPEAL	56	58	59	59	57	58

MENU PLANNING IN DAY CARE CENTERS

Utility scores for nutrient content and for sensory appeal were the same irrespective of participation in the **Menu Planning and Kitchen Economy** workshop. Almost all of the menu sets provided adequate amounts of protein, vitamin A, and vitamin C. They were deficient in supplying food energy and iron. The menus earned high marks for variety of colors but were weak in offering acceptable variety of fruits. More than half of the menu sets presented meals that had harmony of flavors. However, there were a substantial number of menus that described meals whose flavors would be seriously out of balance. The burritos, spinach, and carrots on one of the lunch menus, for example, would not be likely to encourage children to practice good eating habits.

This pattern of strengths and weaknesses was the same for times before and after the workshop and also the same in groups that had and had not participated in the workshop. Thus, the curriculum of the **Menu Planning and Kitchen Economy** did not have the desired effect on menu planning behavior.

More detail about procedures and results of this study are included in the evaluation report entitled **The Effects of Nutrition Education and Training on Day Care Center Menus: January through July 1985** included as Attachment C to this summary report.

Reasons for Nonparticipation in Workshops

Workshop trainers identified lack of information and lack of incentives as barriers to workshop participation.

	Percentage of Trainers Indicating This Problem Is An Important and Frequent Barrier To Workshop Participation
Don't know about workshop scheduling	95
Don't know workshops are available	84
Don't know workshops are free	80
Don't know how to preregister	80
Administrators don't make time available	80
School officials don't advocate participation	72
Don't believe nutrition education can reduce food waste or improve well-being	72

REASONS FOR NONPARTICIPATION IN WORKSHOPS

Workshop trainers identified lack of information and lack of incentives as barriers to workshop participation. In December 1984, there was consensus among the trainers that potential participants didn't know that workshops are available, didn't know that workshops are free, didn't know when or where workshops can be scheduled, and didn't know how to preregister for the workshops. Trainers also were in agreement that potential participants didn't think that the workshops are needed and were not being encouraged to participate by their local school officials (i.e., they are not compensated for time they would spend in the workshops and local school officials do not endorse or advocate participation in the workshops).

The response to the item about need for the workshop was unexpected. It indicates that the majority of trainers feel that a substantial segment of the target population does not accept the premise on which NET is based--that nutrition education can reduce food waste and improve the well-being of children.

More detail about procedures and results of this study are included in the evaluation report entitled **Reasons for Nonparticipation in Nutrition Education and Training (NET) Program Workshops during 1984** included as Attachment D to this summary report.

EFFECTS OF EFFORTS TO PUBLICIZE THE LENDING LIBRARY COLLECTION

Use of the NET library collection increased dramatically after the catalog was distributed, but use by staff of child care centers and registered family homes remained relatively low. The number of borrowers, the number of audio-visual materials borrowed, and the number of persons reached per month increased by more than 300 percent after publication of **Volume I: Audio-visual Materials** of the media catalog in December 1984. These changes met Gottman's criteria for statistical significance and exceeded the 150 percent increase in use of the library that program staff had anticipated in the state plan for 1985.

The increase in the number of borrowers who are staff of child care facilities and schools was relatively small. Their numbers increased by 175 percent (rising from 4 to 11 per month), whereas the number of other persons using the library increased by 700 percent (rising from 2 to 18 per month). This differential increase changed the borrowing pattern. Before the catalog was published, two-thirds of the borrowers were from schools and child care facilities. After the catalog was published, fewer than half of the borrowers were from this primary target group. Use of the library by operators of registered family homes was virtually nonexistant.

Other efforts to publicize the library had lesser effects on borrowing patterns. Chi-squared analysis of borrowing rates for selected library items showed a slight but statistically insignificant increase in use of the items after they were recommended in an article published in the **Texas Child Care Quarterly**. Repeated measures analysis of variance showed NET workshop curricula to be effective in increasing knowledge and shaping favorable attitudes toward the library, but the workshops had virtually no effect on actual use of the library: only 3 of 1,500 workshop participants were also library users between January and June 1985.

More detail about procedures and results of this study are included in the evaluation report entitled **Use of the Nutrition Education and Training (NET) Lending Library Collection: October 1983 through June 1985** included as attachment E to this summary report.

USE OF NUTRITION EDUCATION AND FOOD SERVICE MATERIALS

Materials distributed by the NET program have achieved acceptable levels of use. Each of the materials included in the survey was used by at least 60 percent of the workshop participants who reported receiving them. This value exceeded the criterion for acceptable level of use. Respondents who reported using the materials used them more than once.

Many of the survey respondents indicated that changes in the content or format of the materials would make them more useful. When the recommendations of the entire group of users was inspected, there was no apparent consensus about precisely what changes should be made. When the recommendations were cross-tabulated with frequency of use, the recommendations began to be more systematic. Infrequent users were not able to agree on what changes were needed, but there was some consensus among frequent users. They recommended including more games in the **Food...Early Choices** kit, simplifying **Economy in the Kitchen**, including more information on cooking with children in **More than Graham Crackers**, and adding colored pictures to the **Food is Good** series.

The Spanish language version of the **Food is Good** series was used by more than 10 percent of its recipients, but use of the translation of **Economy in the Kitchen** did not reach this criterion value. Because all of the survey questionnaires were written in English, it is possible that Spanish speaking workshop participants were under represented in this study. Such under representation might explain the low level of use reported for materials printed in Spanish.

More detail about procedures and results of this study are included in the evaluation report entitled **Use of Nutrition Education and Training Materials: January through August 1985** included as Attachment F to this summary report.

CONCLUSIONS

NET PROGRAM ACTIVITIES HAVE BEEN EFFECTIVE IN HELPING PROVIDE OPPORTUNITIES FOR CHILDREN TO LEARN GOOD EATING HABITS.

- NUTRITION-RELATED KNOWLEDGE AND ATTITUDES OF THE CHILDREN'S TEACHERS AND FOOD SERVICE STAFF WAS INCREASED.
- PROGRAM ACTIVITIES APPEARED TO HAVE SOME FACILITATING EFFECTS ON NUTRITION EDUCATION IN CHILD CARE CENTERS.
- THE PROGRAM DID NOT HAVE ANY DIRECT EFFECTS ON MENUS PLANNED FOR FOR CHILDREN IN DAY CARE CENTERS.
- NUTRITION INFORMATION-SEEKING BEHAVIOR OF TEACHERS AND FOOD SERVICE PERSONNEL WAS INCREASED.

CONCLUSIONS

NET program activities have been effective in helping provide opportunities for children to learn good eating habits. NET workshops had strong facilitating effects on nutrition-related knowledge and attitudes of teachers and food service personnel working in child care facilities. There was evidence that nutrition learning activities conducted in child care facilities are more effective as a result of the NET program. When teachers have participated in NET workshops on how to conduct nutrition education for preschool children, the pattern of nutrition learning activities in child care centers more nearly matches the ideal. In addition, teachers frequently use nutrition education materials distributed to them through the NET program and they occasionally use materials borrowed from the NET lending library collection.

The program has been less successful in helping provide opportunities for children to practice good eating habits in child care facilities. Although the workshops contributed to increased knowledge and more positive attitudes about food service management, menus used in day care centers were no different after the **Menu Planning and Kitchen Economy** workshop than they were before. There are several possible reasons why the workshop curriculum failed to facilitate menu planning behavior. It may be that the principles of effective menu planning are easier to know than to apply. Another possibility is that the people who participated in the workshops may not be the ones who actually plan day care center menus. Finally, it may be that factors such as food availability or externally monitored food service standards have more definitive effects on menu planning than does staff training.

The program did have positive effects on nutrition information-seeking behavior of teachers and food service personnel in child care facilities. Workshop participation rose slightly from 1,950 individual participants in 1984 to 2,075 during fiscal year 1985. There was a dramatic increase in use of the NET lending library collection. Although gains in number of borrowers who were educators or food service staff in schools or child care facilities was relatively modest, the number of food service personnel reached through the library was one of the most notable changes in the borrowing pattern. There was a major increase in use of borrowed materials during presentations to school or child care center food service personnel. The number of school or center food service staff reached thereby rose from an average of 1 per month before the media catalog was published to an average of 66 per month after the catalog appeared. NET program activities thus appear to be encouraging ongoing nutrition learning by staff of schools and child care facilities.

RECOMMENDATIONS

INTENSIFYING EFFORTS TO HELP DAY CARE CENTERS PLAN BETTER MENUS AND ADJUSTING PROGRAM ACTIVITIES TO INCREASE SUPPORT FOR NUTRITION EDUCATION AND TRAINING IN PUBLIC SCHOOLS ARE PARTICULAR TARGETS FOR IMPROVEMENT.

* PREPLANNED CYCLE MENUS AND STANDARDIZED RECIPES FOR CHILD CARE FACILITIES WOULD AUGMENT THE EFFECTS OF MENU PLANNING WORKSHOPS.

* THE 1985 ASSESSMENT OF PUBLIC SCHOOLS' NEEDS TOGETHER WITH RESULTS OF THE EVALUATION STUDIES PROVIDE INFORMATION THAT CAN ASSIST IN PLANNING PROGRAM ACTIVITIES TO SUPPORT NUTRITION EDUCATION EFFORTS OF EDUCATORS AND FOOD SERVICE PERSONNEL IN PUBLIC SCHOOLS.

RECOMMENDATIONS

Intensifying efforts to help day care centers plan better menus and adjusting program activities to increase support for nutrition education and training in public schools are particular targets for improvement. Menus were unaffected by staff training despite the demonstrated effectiveness of the training as a facilitator of knowledge and attitudes about effective menu planning. Resources and services in addition to improved training may be needed to help day care centers plan menus that encourage children to practice good eating habits. Possibilities for augmenting the effects of the menu planning workshop include providing day care centers with preplanned cycle menus and standardized recipes. The NET state plan for 1986 has as one of its objectives the development of such menus and recipes. The workshop curriculum should probably be amended to assure that it is effective in communicating cycle menu concepts. Cycle menus was the one content area in which the current workshop curriculum failed to facilitate mastery of knowledge objectives. Curriculum changes will be needed to assure that staff of participating child care facilities learn what they need to know in order to accept and use cycle menus and standardized recipes.

Another strategic direction for improving current NET activities is in expanding services to support nutrition education and food service management practices in public schools. The NET lending library collection is a major vehicle for supporting activities in public schools. Copies of the media catalog have been supplied to all public schools that responded to an invitation to receive the catalog. The study of library use during 1985 showed that there is some use of the NET collection by educators and food service personnel in public schools. However, this level of support for nutrition education and training in public schools will not achieve the federal goal of assuring that all children have opportunities to learn and to practice good eating habits. The needs assessment conducted in public schools during 1985 together with results of the evaluation studies reported in this volume provide information to assist in planning activities to support efforts of educators and food service personnel in public schools to help all children learn about and practice good eating habits.

APPENDIX A

EVALUATION REPORT

Performance of Nutrition Education and Training (NET) Workshops

January through July 1985

EXECUTIVE SUMMARY

NUTRITION EDUCATION AND TRAINING (NET) WORKSHOPS ARE EFFECTIVELY COMMUNICATING NUTRITION-RELATED INFORMATION TO SUBSTANTIAL NUMBERS OF EDUCATORS AND FOOD SERVICE PERSONNEL IN CHILD CARE CENTERS AND INSTITUTIONS.

	KNOWLEGE TESTS			ATTITUDE SCALES	
	AVERAGE PERCENT CORRECT			AVERAGE SCORE	
WORKSHOP	BEFORE	DURING	AFTER	BEFORE	AFTER
NUTRITION & THE PRESCHOOL CHILD	53	71	72	3.9	4.4
FOOD...EARLY CHOICES	73	81	81	4.2	4.8
MENU PLANNING & KITCHEN ECONOMY	48	63	76	4.4	4.7
KITCHEN MATH & FOOD PURCHASING	54	79	88	3.7	4.1

EXECUTIVE SUMMARY

Nutrition Education and Training (NET) workshops are effectively communicating nutrition-related information to substantial numbers of educators and food service personnel in child care centers and institutions. The workshops are a major activity of the federally funded Texas NET Program. By teaching topics in nutrition fundamentals, nutrition education, and food service management to educators and food service staff, the workshops help to achieve the program goal of ensuring that children have opportunities to learn about and practice good eating habits--habits that decrease food waste and improve well-being.

This study was conducted to determine the extent to which the workshop curricula facilitate mastery of nutrition-related knowledge and attitude objectives. Knowledge tests administered before, during, and two months after workshops provided data on mastery of knowledge objectives. Attitude questionnaires mailed to participants two months after workshops provided data on mastery of attitude objectives. These data were submitted to repeated-measures analysis of variance, criterion-referenced goal attainment analysis, and item response analysis to determine effectiveness and to diagnose relative strengths and weaknesses of the workshop curricula.

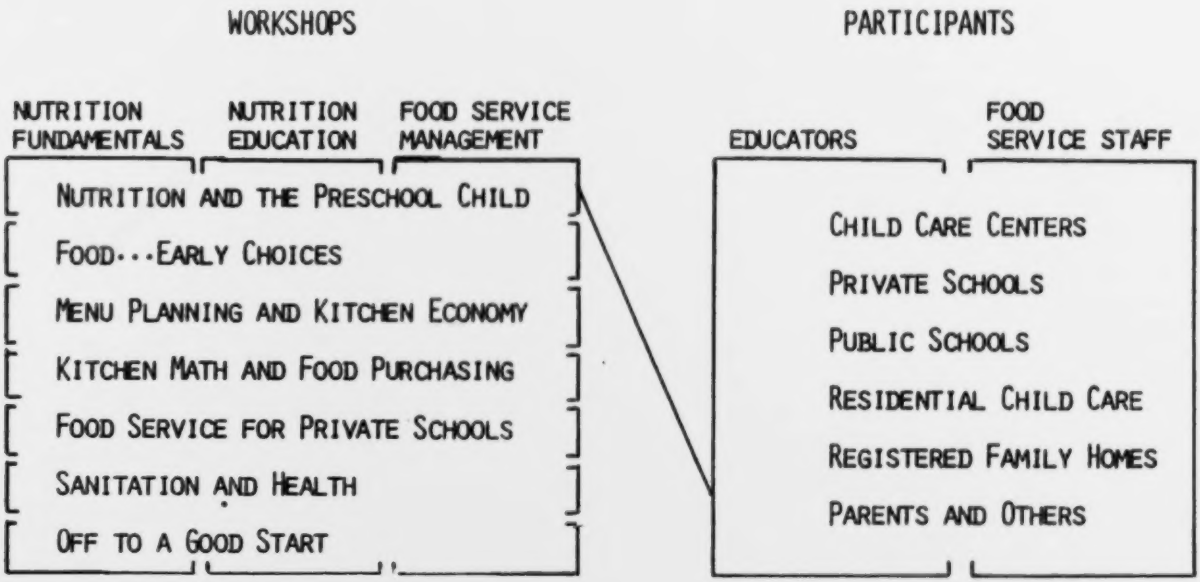
More than 1,500 educators and food service personnel participated in the workshops between January and July, 1985. Average scores on knowledge tests and attitude scales were higher after workshops than they were before. Gains were realized in all three of the major content areas. Goal attainment criteria were met in all four of the workshops that were evaluated. Change in knowledge was substantial and statistically reliable. Change in attitudes was small because attitudes were already positive before the workshops. Although small, the measured improvement in attitudes was statistically reliable.

There are areas where curriculum performance can be enhanced. Cycle menu concepts were not mastered in the **Menu Planning and Kitchen Economy** workshops. Other potential problem areas are the role of parents in nutrition education, children's needs for protein, tips for kitchen economy, and information needed to calculate amounts of food.

Improvements in the tests and questionnaires and continued monitoring of workshop performance are needed to keep track of how much nutrition-related information is being communicated to the target population and to identify needs for continued improvement of the workshop curricula.

BACKGROUND

NET WORKSHOPS ARE CONDUCTED TO TEACH TOPICS IN NUTRITION FUNDAMENTALS, NUTRITION EDUCATION, AND FOOD SERVICE MANAGEMENT.



BACKGROUND

Nutrition Education and Training (NET) workshops are conducted to teach topics in nutrition fundamentals, nutrition education, and food service management. The workshops are a major activity of the federally funded Texas NET Program. The goal of the program is to ensure that children have opportunites to learn about and practice good eating habits. The workshops help to achieve this goal by providing nutrition-related information to educators and food service staff in non-profit child care centers and schools.

There are seven workshops offered through the Texas NET Program. The workshop topics were selected and the curricula developed to meet needs identified during formal needs assessments. Two of the workshops--**Nutrition and the Preschool Child** and **Food...Early Choices**--are for teachers in child care centers. Four of the workshops--**Menu Planning and Kitchen Economy, Kitchen Math and Food Purchasing, Food Service for Private Schools and Residential Child Care Institutions**, and **Sanitation and Health**--are for food service personnel working in schools or child care centers. One workshop--**Off to a Good Start**--is designed especially for operators or sponsors of registered family homes.

The workshops are conducted in the participants' own communities by registered and licensed dietitians who live in the community. They are scheduled for full- or half-day sessions. Workshop dates are arranged by the workshop trainers in compliance with requests from the participants. Workshops are free of charge. Training provided in the workshops meets Texas Department of Human Services (DHS) requirements for continuing education for staff of licensed day care centers. Certificates of completed training are awarded. All participants receive copies of selected nutrition education materials as an additional incentive for their participation.

KNOWLEDGE, ATTITUDE, AND BEHAVIORAL OBJECTIVES ARE DEFINED FOR EACH OF THE WORKSHOP CURRICULA.

OBJECTIVES*

SECTION I - MENU PLANNING

1. Given basic information about leader nutrients and the Four Food Groups, participants will recognize leader nutrients and identify the food group of a given list of foods.

2. Given information on leader nutrients, the classification of foods, and menu cycling, participants will prepare a checklist for evaluating menus.

3. Given a sample menu for feeding children, participants will evaluate the menu using the checklist and make necessary changes.

4. Using the Menu Evaluation Checklist and Exercise #3, participants will improve the menus and make necessary changes to meet the nutritional needs of children or improve the taste or visual appeal of the food.

5. Given a list of available foods to use in menu planning, participants will develop a menu which meets the checklist requirements.

SECTION II - KITCHEN ECONOMY

1. Given information on cutting costs in the kitchen, participants will evaluate menus and make any changes which could reduce costs without adversely affecting the nutritional needs or visual or taste appeal of the food.

2. Given information on the use of meat alternates as a protein source and preparation of inexpensive cuts of meat, participants will share and develop ideas for menu plans and recipes for meat alternates and the use of inexpensive cuts of meat.

* This example is from the Menu Planning and Kitchen Economy Workbook. Workbooks used in the other workshops also describe learning objectives for those workshops.

Knowledge, attitude, and behavioral objectives are defined for each of the workshop curricula. Top-level learning objectives are written in the preface of the workbooks which participants use during the sessions. They also are written into the instructional process described in the curriculum guides used by the workshop trainers.

The curriculum guide describes the content of the workshop. It also prescribes an instructional process to facilitate mastery of the learning objectives. Workshops begin with an "ice-breaking" activity. After the ice-breaker, participants complete the registration form in their workbooks. When the forms have been collected, the trainer introduces the goals of the NET program and explains the learning objectives.

A test, called Exercise A, is administered to measure participants' knowledge of the content before the workshop. Participants are advised that the purpose of the exercise is to determine how well the workshop was conducted--that scores for this exercise will be compared with those from the final workshop exercise to find out how much the workshop helped them to learn.

When Exercise A is completed, the trainer begins instruction and activities to help participants master the first learning objective. The curriculum is divided into sections corresponding to the list of learning objectives. Each section closes with an exercise that provides feedback to participants about their mastery of that particular objective. Many of the exercises are designed for group completion. Frequent use is made of audio-visual aids. Breaks are scheduled. All of these features of the instructional process help to keep the participants comfortable and motivated to learn.

The final activity is the posttest, called Exercise B. The test is open-book in order to simulate on-the-job performance. When participants have answered all questions on the test, the trainer reviews the items and discusses the correct answers. The workshop closes with award of workshop certificates.

THIS STUDY EXAMINES THE EXTENT TO WHICH WORKSHOP CURRICULA FACILITATE MASTERY OF KNOWLEDGE AND ATTITUDE OBJECTIVES.

- DO WORKSHOP PARTICIPANTS KNOW MORE ABOUT NUTRITION TOPICS AFTER THE WORKSHOPS THAN THEY DID BEFORE?
- DO WORKSHOP PARTICIPANTS HAVE MORE POSITIVE ATTITUDES TOWARD NUTRITION EDUCATION AND FOOD SERVICE MANAGEMENT AFTER WORKSHOPS THAN THEY DID BEFORE?
- WHAT ARE THE RELATIVE STRENGTHS AND WEAKNESSES OF THE CURRICULA?

This study examines the extent to which the workshop curricula facilitate mastery of knowledge and attitude objectives. Data from the pre- and post-tests (Exercises A and B) were supplemented with data from a follow-up test (Exercise C) mailed to a sample of workshop participants two months after the workshop. These data were used to determine how much more the participants knew after the workshop than they did before. A survey of attitudes toward nutrition education and food service management concepts was mailed to a sample of participants after the workshops. They were asked to report their current attitudes as well as to indicate what their attitudes were before the workshop. These data were used to determine how effective the workshop curricula were in shaping attitudes.

Relative strengths and weaknesses of each of the curricula were diagnosed by examining responses to particular items on the tests and survey forms. Performance was compared against predetermined mastery criteria and against performance on other items.

Information developed in this study is needed to monitor progress of the NET program--i.e. to keep track of how much nutrition-related information has been effectively communicated to educators and food service personnel in child care centers and schools. Results of this study also are needed to identify areas where changes may be needed in the curricula. By identifying areas where participants have already achieved mastery before the workshops and by identifying areas where mastery is not achieved even after the workshop, this study provides information that can be used to help make the workshops more effective.

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PROCEDURES

TESTS ADMINISTERED BEFORE, DURING, AND AFTER WORKSHOPS PROVIDED DATA ON MASTERY OF KNOWLEDGE OBJECTIVES.

MENU PLANNING AND KITCHEN ECONOMY

Exercise A
Your SSN:

Date: Mo/ Da/ Yr

Office Use Only
Version
(1) 2 3
Type
pre post flo
(1) 2 3
Workshop ID

Directions. Read each item carefully. For each item choose the one BEST ANSWER. Circle the number next to the one best answer for each item.

1. Nutrition is:

   1 the food you eat and how your body uses it
   2 eating
   3 the calorie content of food
   4 a vitamin and mineral supplement
   5 three meals a day

2. An easy-to-use guide for good food selection is:

   1 USDA requirements
   2 nutrition education
   3 Basic Four Food Groups
   4 calorie counting
   5 all of the above

✓ 3. Given the following menu, what would be best to change for a group of six year olds?

   Oven Fried Chicken
   Baked Potato, Broccoli
   Chocolate Cake
   Milk

   1 Serve fat free milk only because of protein needs of the growing child.
   2 Substitute a lettuce salad for the baked potato because children like to eat vegetables that are the same color.
   3 Omit broccoli because most children do not like to eat vegetables.
   4 Serve a blueberry muffin instead of chocolate cake because children should limit their intake of foods from the fifth food group.
   5 I don't know

4. Below are four statements on kitchen economy principles. Three of the statements are true. One of the statements is false. Which one is false?

   1 Homemade muffins, cornbread, and other quick-breads usually cost less per serving than a loaf of bread.
   2 Fresh fruits and vegetables cost less and taste best if they are served when they are in season.
   3 Food sold in large quantity containers is always cheaper than the smaller quantity.
   4 Inexpensive cuts of meat should be cooked in moist heat at low temperatures to tenderize them.
   5 I don't know.

5. Which of the following foods has the most Vitamin C?

   1 an egg
   2 a cup of milk
   3 1/2 cup green beans
   4 a cup of corn flakes
   5 a tomato

✓ 6. Which of the following is the best source of Vitamin A?

   1 apples
   2 head lettuce
   3 oranges
   4 chicken
   5 sweet potatoes

7. What is the best way to make sure your body is getting enough nutrients?

   1 eat yogurt
   2 eat a variety of foods
   3 eat lots of fruits and vegetables
   4 take vitamin pills
   5 eat meat every day

8. A cycle menu is:

   1 used once and thrown away
   2 used once and kept for 30 days
   3 modified only when fruits and vegetables are in season
   4 modified frequently to allow for new recipes and holiday menus
   5 none of the above

9. Which of the menus listed below contains the best variety of color, flavor, and texture?

   1 meat loaf, baked potato, tossed vegetable salad, whole grain bread
   2 ham, sweet potatoes, mandarin oranges in orange gelatin, whole grain bread
   3 oven fried chicken, french fries, cornbread, cauliflower
   4 baked fish, mashed potatoes, peas, pears in lime gelatin
   5 macaroni and cheese, stewed tomatoes, bread, peach slices

PROCEDURES

Tests administered before, during, and after workshops provided data on mastery of knowledge objectives. The test items were adapted from standardized nutrition knowledge tests and tests written by the Texas NET staff. Each test item had five response alternatives in a forced-choice format. Workshop participants were instructed to select the one best reponse alternative for each item. The reading level of the tests was evaluated using Fry's method. Items were adjusted as necessary to assure that the tests required a reading level no higher than ninth grade.

The items appearing on the tests for a given workshop sampled knowledge needed to master the workshop objectives. Some of the items tested factual knowledge. For example, one of the items on the test administerd in the **Menu Planning and Kitchen Economy** workshop asked participants to identify a food that is high in vitamin A. Other test items probed operational knowledge. Another item on the **Menu Planning and Kitchen Economy** test, for example, asked participants to evaluate a menu and recommend suitable changes to improve the nutritional value of the meal for a six-year old child.

Three versions of the test were developed for each workshop so that pre-, post-, and follow-up-tests would not be identical with one another. The same items appeared on each version, but the sequence of items was different. Having the same items on all three tests increased the comparability of performance before, during, and after the workshop. Having the items in a different sequence on the different tests reduced the effects of test specific memory. The version used as pre-, post-, and follow-up was counterbalanced across workshops conducted on different dates.

Workshop trainers administered the pre- and post-tests at the beginning and the close of the workshop. The follow-up test was mailed to a sample of workshop participants approximately two months after their participation. The sample was drawn systematically from the first 300 participants in a given workshop. Individuals were selected according to the last digit in their Social Security Number--if the final digit was odd, that individual was selected to receive a copy of the follow-up test (Exercise C). This final test was printed on yellow paper, covered with a letter requesting the participant's assistance in evaluating the workshop, and accompanied by a postage-paid return envelope. These procedures encourage return of mailed data collection forms.

ATTITUDE QUESTIONNAIRES MAILED TO PARTICIPANTS TWO MONTHS AFTER WORKSHOPS PROVIDED DATA ON MASTERY OF ATTITUDE OBJECTIVES.

NUTRITION AND THE PRESCHOOL CHILD
Follow-up Questionnaire

Your Social Security Number
_____

Workshop I.D.
_____

Date: Mo/ Da/ Yr
__ __ __

Section I

Please answer question A and question B for each item. Choose only **one answer** for each question. CIRCLE the number next to the answer you choose.

1. A. How much classroom time do you think should be spent teaching nutrition to preschool children?

   1 a very large amount
   2 a large amount
   3 a moderate amount
   4 a small amount
   5 none

   B. **Before** you attended the workshop, how much classroom time did you think should be spent teaching nutrition to preschool children?

   1 a very large amount
   2 a large amount
   3 a moderate amount
   4 a small amount
   5 none

5. A. Do you agree with the statement that learning about the relationship between food and health is one of the most important things children can do in preschool?

   1 strongly agree
   2 agree
   3 uncertain
   4 disagree
   5 strongly disagree

   B. **Before** you attended the workshop, did you agree with the statement that learning about the relationship between food and health is one of the most important things children can do in preschool?

   1 strongly agree
   2 agree
   3 uncertain
   4 disagree
   5 strongly disagree

6. A. How do you feel about the NET Lending Library Collection?

   1 it's a very useful resource
   2 it's somewhat useful
   3 it's only marginally useful
   4 it's not useful for me, but could be useful to others
   5 it's of no use at all

   B. **Before** you attended the workshop, how would you have felt about the NET Lending Library Collection?

   1 it's a very useful resource
   2 it's somewhat useful
   3 it's only marginally useful
   4 it's not useful for me, but could be useful to others
   5 it's of no use at all

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Attitude questionnaires mailed to participants two months after workshop attendance provided data on mastery of attitude objectives. The items on the questionnaire had five response alternatives that made a Likert type scale. Each point on the scale was anchored for the particular item. Responses were scaled from "very positive" to "very negative". During data analysis, responses were recoded so that the scale ran from 5 for "very positive" to 1 for "very negative." The reading level of the questionnaires was evaluated using Fry's method. Items were adjusted as necessary to assure that the tests required a reading level no higher than ninth grade.

Items on the questionnaire were modelled after those on standardized nutrition attitude surveys. The actual items were developed by the NET staff. Items on standardized nutrition attitudes surveys probe attitudes toward one's own nutrition. The learning objectives in the Texas NET workshops concern nutrition education and food service management and, therefore, the nutrition of one's students. Items on the follow-up questionnaire were developed to assess attitudes toward nutrition education and food service management. One of the items on the questionnaire for the **Nutrition and the Preschool Child** workshop, for example, asks educators how important it is for children to learn about nutrition in preschool.

The questionnaires required participants to report their current attitudes and then indicate what their attitudes were before the workshop. This data collection procedure is referred to as a retrospective pretest or a then-posttest. It has two advantages for this study. First, it captured data about attitudes before the workshop without taking up valuable workshop time. Second, it assured that participants had the same frame of reference for reporting their attitudes before and after the workshop.

The follow-up questionnaire was mailed to a sample of individuals drawn systematically from the first 300 participants in a given workshop. Individuals were selected according to the last digit in their Social Security Number--if the final digit was even, that individual was selected to receive a copy of the follow-up questionnaire. The questionnaire was printed on pink paper, covered with a letter requesting the participant's assistance in evaluating the workshop, and accompanied by a postage-paid return envelope. These procedures encourage return of mailed questionnaires.

THE TESTS AND QUESTIONNAIRES WERE REVIEWED AND ADJUSTED TO ENHANCE CONTENT VALIDITY AND MEASUREMENT RELIABILITY.

	KNOWLEDGE TEST		ATTITUDES QUESTIONNAIRE	
WORKSHOP	CASES	RELIABILITY	CASES	RELIABILITY
NUTRITION & THE PRESCHOOL CHILD	149	.75	44	.39
FOOD...EARLY CHOICES	199	.45	46	.54
MENU PLANNING & KITCHEN ECONOMY	154	.80	42	.56
KITCHEN MATH & FOOD PURCHASING	80	.83	14	--

The tests and questionnaires were reviewed and adjusted to enhance content validity and measurement reliability. Content validity was checked in three ways. First, all of the items included on any of the data collection forms were generated or reviewed by registered and licensed dietitians on the NET Program staff. Second, the items used to evaluate a given workshop were cross-checked against a content framework. The NET Program Coordinator assisted in constructing the content framework to guide development of the data collection instruments. The framework is a matrix in which the column headings identify topics to be covered in the workshop. The row headings describe dimensions or levels of coverage. The NET Program staff used the matrix to summarize workshop content by checking cells in the matrix that described specific learning objectives for the different workshops. The test and survey items were cross-checked against these specific learning objectives. Finally, the test and survey items were sorted into groups corresponding to the top-level objectives for the different workshops. Adjustments were made as necessary to assure that the test and survey items were representative of the workshop content.

Measurement reliability was checked using SPSS-X procedures for computing coefficient alpha (the Kuder-Richardson reliability formula). These procedures were applied when at least 50 completed data forms were available for a given workshop. Reliability of the knowledge tests was generally satisfactory, generating alphas greater than .70. When it was possible to enhance test reliability without seriously diminishing the diagnostic capabilities of the test, items that were not performing well were dropped from further analyses.

Reliability of the attitudes questionnaires was less satisfactory than for the knowledge tests. Reliability coefficients for these scales were less than .70. This low reliability has two probable sources. First, the scales are very short--five or six items each. High reliability is harder to achieve with short scales than with long ones because it is difficult to draw an accurate sample of the content with so few items. Second, the respondents used only the positive end of the scale. It will be necessary to do follow-up work to increase confidence in conclusions drawn from analyses of the attitudes data.

At the time this report was prepared, enough data were available to evaluate performance of four of the workshops. Results are presented for these four workshops: **Nutrition and the Preschool Child, Food...Early Choices, Menu Planning and Kitchen Economy**, and **Kitchen Math and Food Purchasing.**

STATISTICAL AND ITEM ANALYSES WERE CONDUCTED TO DETERMINE THE EFFECTIVENESS OF THE WORKSHOP CURRICULA.

* EFFECTS OF THE CURRICULA ON PARTICIPANT KNOWLEDGE AND ATTITUDES WERE VERIFIED IN REPEATED MEASURES ANALYSIS OF VARIANCE.

* RELATIVE STRENGTHS AND WEAKNESSES OF THE CURRICULA WERE EVALUATED IN CRITERION REFERENCED AND ITEM RESPONSE ANALYSES.

Statistical and item analyses were conducted to determine effectiveness of the workshop curricula. Percents correct on knowledge tests before, during, and after the workshop were compared to determine what effect the curricula had on mastery of knowledge objectives. Average attitude scale values reported for times before and after the workshop were compared to determine the effect that the curricula had in shaping attitudes toward nutrition education and food service management. Statistical reliability of obtained differences was verified using SPSS-X procedures for repeated measures analysis of variance. When the scores were found to be reliably higher after the workshop than before, it was concluded that the workshop curricula had facilitated mastery of the knowledge and attitude learning objectives.

In order to diagnose relative strengths and weaknesses in the curricula, performance on specific test and questionnaire items was inspected. Performance goals were set for the items and actual performance was compared against the goal. For the knowledge tests, the goal was 70 percent correct. If 70 percent of the participants responded correctly, it was concluded that mastery was well represented in the population. This criterion was used to identify content areas in which mastery existed before the workshop, to identify areas in which mastery was facilitated by the workshop curricula, and to identify areas in which the workshop curricula failed to facilitate mastery. For those items on which mastery was not achieved, item responses were analyzed to determine possible reasons for the prevalence of incorrect reponses.

Test performance in workshops in which the majority of participants were Hispanic was compared with that for workshops having a low percentage of Hispanic participants. This analysis was conducted at the request of workshop trainers who are concerned about the potential for language or culture bias in the tests.

RESULTS

AVERAGE SCORES ON KNOWLEDGE TESTS AND ATTITUDE SCALES WERE HIGHER AFTER WORKSHOPS THAN THEY WERE BEFORE.

	KNOWLEDGE TESTS			ATTITUDE SCALES	
	AVERAGE PERCENT CORRECT			AVERAGE SCORE	
CONTENT AREA	BEFORE	DURING	AFTER	BEFORE	AFTER
NUTRITION FUNDAMENTALS	51	78	76	--	--
NUTRITION EDUCATION	66	74	78	4.0	4.6
FOOD SERVICE MANAGEMENT	47	68	81	4.0	4.4
NET LIBRARY SERVICE	74	88	84	3.8	4.4

RESULTS

Average scores on knowledge tests and attitude scales were higher after workshops than they were before. The average percents correct on knowledge tests before, during, and after the workshop were 54, 72, and 78. Scores on Exercise B which was administered at the close of the workshops and on Exercise C which was mailed to participants two months after the workshops met the mastery criterion. The average scores on the attitude scales also met goal attaiment criteria by being at the "very positive" end of the scale. Scores averaged 4.0 for the time before the workshops and 4.5 after the workshops

The curricula facilitated knowledge acquisition in each of the target content areas. Tests administered in the **Nutrition and the Preschool Child** workshop and in the **Menu Planning and Kitchen Economy** workshop contained items that probed knowledge about the fundamentals of nutrition. The probability of correct response to these items rose from 51 percent before the workshop to 76 percent after the workshop. Tests administered in the **Nutrition and the Preschool Child** workshop and in the **Food...Early Choices** workshop contained items which probed knowledge about nutrition education. The probability of correct response to these items rose from 66 to 78 percent. Tests administered in the **Menu Planning and Kitchen Economy** workshop and in the **Kitchen Math and Food Purchasing** workshop contained items that probed knowledge about food service management. The probability of correct response to these items rose from 47 to 81 percent. For each of these topics, initial performance was below the mastery criterion and performance at the two-month follow-up was well above the mastery criterion. Knowledge about procedures for using the NET lending library collection was checked with a single item on tests administered in the **Nutrition and the Preschool Child**, **Food...Early Choices**, and **Menu Planning and Kitchen Economy** workshops. The probability of correct response to this item was 74 percent before the workshop and 84 percent after the workshop, both performances above the mastery criterion.

The workshop curricula were effective in shaping attitudes toward selected nutrition concepts. Attitude scales mailed to participants of the **Nutrition and the Preschool Child** and **Food...Early Choices** workshops measured attitudes toward nutrition education concepts. Item means were 4.0 before the workshop and 4.6 after the workshop. Attitude scales mailed to participants of the **Menu Planning and Kitchen Economy** and **Kitchen Math and Food Purchasing** workshops measured attitudes toward food service management concepts. Item means on these scales were 4.0 before and 4.4 after the workshop. All of these scores were at or above the mastery criterion. Attitude toward the NET lending library collection was assessed in a single item on the attitude scale mailed to participants of all four of the workshops. The mean for this item rose from 3.8 to 4.4 showing that participants were more favorable toward the library after the workshops than they had been before.

Effects of the Nutrition and the Preschool Child Curriculum

After the workshop, educators scored higher on knowledge tests and reported more favorable attitudes toward nutrition education.

	Average Score		
Scale	Before	During	After
Knowledge	53	71	72
Attitudes	3.9		4.4

EFFECTS OF THE NUTRITION AND THE PRESCHOOL CHILD CURRICULUM

After the workshop, educators scored higher on knowledge tests and reported more favorable attitudes toward nutrition education. Average percents correct before, during, and after the workshop were 53, 71, and 72. Performance on the post- and follow-up-test met the mastery criterion. This improvement in knowledge was substantial and statistically significant, $F(2,56)=12.17$, $p<.001$. The average score on the attitudes scale rose from 3.9 to 4.4. Attitudes before the workshop were marginally below the mastery criterion. Attitudes after the workshop were above the mastery criterion. This change was statistically signficant, $F(1,43)=45.19$, $p<.001$.

There were 42 **Nutrition and the Preschool Child** workshops conducted between January and July 1985. Sixteen of the 22 workshop trainers conducted one or more of these whole-day sessions for groups of participants ranging from 2 to 50. The participant total was more than 670 individuals, 90 percent of them educators working in non-profit child care centers.

Follow-up knowledge tests were mailed to 100 of the first 300 participants in the workshops. Thirty-four completed tests were returned. Twenty-three of these were marked with SSNs that could be matched to the pre- and post-test records. No differences were discerned when percents correct on pre- and post-tests for these 23 were compared with percents correct for the 154 individuals for whom pre-and post-test records were available. There were no apparent differences in test performance in workshops with a high percentage ($p > .80$) of Hispanic participants. Average percents correct in these workshops were 52, 70, and 55 compared with 46, 61, and 62 obtained in workshops with a low percentage ($p < .50$) of Hispanic participants.

Attitude questionnaires were mailed to 120 of the first 300 participants in the workshops. Forty-four completed questionnaires were returned.

PARTICIPANTS IN THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP HAD TROUBLE ANSWERING QUESTIONS ABOUT VITAMINS AND MINERALS AND ABOUT PARENT INVOLVEMENT IN NUTRITION EDUCATION.

Mastery of Objectives I, II, & III: Know the principles of good nutrition

Item	Percent Correct Exercise	A	B	C
(1) Nutrition is		78	91	91
(2) Children need nutrients		57	74	87
(3) Vitamin A every other day		26	48	39
(4) Vitamin C every day		17	44	52
(5) Functions of minerals		22	70	44
(6) Small meals preferred		44	83	78
(7) Functions of nutrients		70	82	77
(8) Extra foods		52	74	83
(11) Nutrition health problems		44	91	70
(19) Water is a nutrient		57	70	74

Mastery of Objectives IV, V, & VI: Know how to prepare, present, & evaluate nutrition learning activities

Item	Percent Correct Exercise	A	B	C
(9) Tip for cooking activities		57	78	70
(10) Influence eating habits		70	44	70
(12) Nutrition fits curricula		44	57	70
(13) Learning activities should		61	61	87
(15) Need to evaluate		61	77	71
(17) The Florida curriculum		48	57	74
(18) Team to promote nutrition		65	83	74
(16) Library procedures		87	96	83

Participants in the **Nutrition and the Preschool Child** workshop had trouble answering questions about vitamins and minerals and about parent involvement in nutrition education. Before the workshop, only about a quarter of the participants were able to respond correctly to items 3, 4, and 5 which probed knowledge about children's needs for vitamins A and C and the functions of minerals. By the end of the workshop approximately half of the participants knew the correct answers to these questions. This percentage of correct response was maintained on the follow-up test. Although this change is substantial, it did not reach the mastery criterion. "Protein" was an incorrect response that often occurred for these items. Participants' concerns about children's needs for protein may be interfering with learning about vitamins and minerals.

Items 10, 13, 17, and 18 touched on the issue of involving parents in their children's nutrition learning. On the pretest and the posttest, approximately 61 percent of the participants gave correct responses to these items. It appeared that the curriculum was having no effect in shaping the participants' knowledge about parent involvement. On the follow-up test, however, the percent correct increased for every item in this set so that the average percent correct was 76, a value which exceeded the mastery criterion. It may be that parent involvement in nutrition education is a concept that is mastered by doing--i.e. that when educators attempt to implement the nutrition curriculum presented in the workshop, they discover a role for parents.

Results of the pretest showed that participants had much to learn about the fundamentals of nutrition and about nutrition education concepts. The average was 46 percent correct for nutrition fundamentals and 58 percent correct for nutrition education concepts. At the close of the workshop it appeared that the curriculum was more effective in communicating information about nutrition fundamentals than about nutrition education. The 72 percent correct response rate for nutrition fundamentals exceeded the mastery criterion. The percent correct for nutrition education concepts was only 65 percent. At the follow-up, however, this situation was reversed. The percent correct for nutrition fundamentals dropped slightly to 69 percent but the percent correct for nutrition education concepts rose to 75.

PARTICIPANTS IN THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP INDICATED THEY WERE WILLING TO ALLOCATE A LARGE AMOUNT OF CLASSROOM TIME TO NUTRITION EDUCATION.

Mastery of Objective VI: Be motivated to teach nutrition

Item	Average Score Before	After
(1) Time should be spent on nutrition	3.0	3.5
(5) Learning about food & health is important	4.2	4.5
(6) Feelings about library	3.7	4.5

Mastery of Objective IV: Accept child/parent/ teacher partnership in nutrition education

Item	Average Score Before	After
(2) Children should be involved in cooking	4.0	4.4
(3) Teachers should encourage trying new foods	4.2	4.8
(4) Parents should be involved	4.5	4.8

Participants in the **Nutrition and the Preschool Child** workshop indicated that they were willing to allocate a large amount of classroom time to nutrition education. They believe that learning about food and health is an important activity for preschool children. They appear to endorse the idea that nutrition learning is a partnership between children, parents, and teachers.

On all of these dimensions, attitudes were more favorable after the workshop than before. The workshop curriculum also fostered a more positive attitude toward the NET lending library collection.

Effects of the Food...Early Choices Workshop Curriculum

After the workshop, educators held more favorable attitudes toward using the Food...Early Choices kit.

	Average Score		
Scale	Before	During	After
Knowledge	73	81	81
Attitudes	4.2		4.8

EFFECTS OF THE FOOD...EARLY CHOICES WORKSHOP CURRICULUM

After the workshop, educators held more favorable attitudes toward using the **Food...Early Choices** kit. The average score on the attitude scale increased from 4.2 to 4.8 on a scale with 5 as its maximum. This change in attitudes was statistically significant, $F(1,45)=53.09$, $p < .001$. Percent correct on the knowledge test rose from 73 to 81. This increase was neither large nor statistically significant. However, the mastery criterion had already been achieved before the workshop.

There were 32 **Food...Early Choices** workshops conducted between January and July 1985. Sixteen of the 22 workshop trainers conducted one or more of these half-day sessions for groups of participants ranging from 6 to 40. The participant total was more than 560, 83 percent of them educators working in non-profit child care centers and 7 percent of them operators of registered family homes.

Follow-up knowledge tests were mailed to 128 of the first 300 participants in the workshops. Forty-one completed tests were returned. Twenty-nine of these were marked with SSNs that could be matched to the pre- and post-test records. No differences were discerned when percents correct on pre- and post-tests for these 29 were compared with percents correct for the 199 individuals for whom pre- and post-test records were available.

Attitudes questionnaires were mailed to 133 of the first 300 participants in the workshops. Forty-eight completed questionnaires were returned.

A QUESTION ASKING ABOUT USES OF THE FOOD...EARLY CHOICES KIT WAS THE ONLY ITEM ON THE KNOWLEDGE TEST THAT PRESENTED ANY PROBLEM FOR THE WORKSHOP PARTICIPANTS.

Mastery of Objective I: Recognize principal concepts of the kit

Item	Percent Correct Exercise	A	B	C
(1) Nutrition is		90	97	79
(4) Kit can teach concepts		97	93	93
(5) Team to promote nutrition		86	76	82
(6) Influence eating habits		14	69	86
(8) Library procedures		79	90	86

Mastery of Objective II: Know basic procedures for using the kit

Item	Percent Correct Exercise	A	B	C
(2) Learning activities should		79	90	97
(3) Food Early Choices is		54	55	48
(7) Tip for cooking activities		83	83	79

A question asking about uses of the **Food...Early Choices** kit was the only item on the knowledge test that presented any problem for the workshop participants. Only half of the participants gave the correct response to this item (item 3). The other half of the workshop participants apparently had difficulty understanding that the kit was a nutrition learning system for adults as well as for 3 and 4 year olds. This was the only item for which performance fell short of the mastery criterion during and after the workshop.

Before the workshop, only about a quarter of the participants thought that parents influence children's eating habits (item 6). On the follow-up test, however, the majority of respondents correctly responded that parents, nutrition education, and other children all influence the eating behavior of young children. This item and item 3 were the only ones for which mastery was not already evident at the beginning of the workshop.

WORKSHOP PARTICIPANTS INDICATED THAT THEY WERE WILLING TO USE THE **FOOD...EARLY CHOICES** KIT.

Mastery of Objective I: Accept principal concepts of the kit

Item	Average Score Before	After
(1) Children should know different preparations	4.5	4.8
(2) Teachers should encourage trying new foods	4.6	5.0

Mastery of Objective II: Be motivated to use the kit

Item	Average Score Before	After
(3) Kit is easy to use	3.8	4.7
(4) Interested in using the kit	4.1	4.7
(5) Feelings about library	3.8	4.6

Workshop participants indicated that they were willing to use the **Food...Early Choices** kit. The workshop curriculum appeared to be particularly effective in persuading participants that the kit would be easy and interesting to use. After the workshop, all of the respondents reported that they felt teachers should always encourage children to try new foods. They agreed strongly with the proposal that children should know that foods can be prepared in different ways. They reported more favorable attitudes toward the NET lending library collection after the workshop than before.

Effects of the Menu Planning and Kitchen Economy Curriculum

Participants knew more about nutrition and reported more positive attitudes toward food service management concepts after the workshop.

Scale	Average Score		
	Before	During	After
Knowledge	48	63	76
Attitudes	4.4		4.7

EFFECTS OF THE MENU PLANNING AND KITCHEN ECONOMY CURRICULUM

Participants knew more about nutrition and reported more positive attitudes toward food service management concepts after the workshop. The probability that a participant would know the correct answer to any given item on the knowledge test rose from 48 to 76 percent. This increase in knowledge was statistically significant, $F(2,56)=27.18$, $p<.001$. Participants performed better on the follow-up test than they had on the test administered at the close of the workshop, suggesting that their experience was reinforcing knowledge they acquired from their workshop participation. Their attitudes changed only slightly because they were already very positive. The average rose from 4.4 to 4.7, a change that was statistically significant, $F(1,41)=34.29$, $p<.001$.

There were 24 **Menu Planning and Kitchen Economy** workshops conducted between January and July 1985. Fifteen of the workshop trainers conducted one or more of these whole-day sessions for groups of participants ranging from 4 to 25. The participant total was more than 340 individuals, 48 percent of them food service personnel in non-profit child care centers. Most of the other participants were educators working in the same child care centers as the participating food service personnel.

Follow-up knowledge tests were mailed to 89 of the first 300 participants in the workshops. Forty-seven completed tests were returned. Twenty-nine of these were marked with SSNs that could be matched to pre- and post-test records. No differences were discerned when percents correct on pre-and post-tests for these 29 were compared with percents correct for the 182 individuals for whom pre- and post-test records were available. There were differences in test performance in workshops with a high percentage ($p>.80$) of Hispanic participants. Lower scores were obtained in these workshops with participants having particular difficulty answering questions about food service management. Average percents correct for these items before, during, and after these workshops were 30, 39, and 53. These scores are considerably lower than the 45, 54, and 84 obtained in workshops with a low percentage ($p<.50$) of Hispanic participants.

Attitude questionnaires were mailed to 87 of the first 300 participants in the workshops. Forty-two completed questionnaires were returned.

PARTICIPANTS IN THE MENU PLANNING AND KITCHEN ECONOMY WORKSHOP HAD TROUBLE ANSWERING QUESTIONS ABOUT CYCLE MENUS AND ABOUT TIPS FOR KITCHEN ECONOMY.

Mastery of Objective I1: Know the principles of good nutrition

Item		Percent Correct Exercise	A	B	C
(1)	Nutrition is		79	79	86
(2)	Food Groups as guide		62	93	83
(5)	Food with C		45	79	97
(6)	Food with A		17	59	72
(7)	Variety for nutrients		69	83	86
(12)	Preschool requirements		31	35	55
(14)	Four food groups		41	66	76
(19)	Iron rich snack		86	83	93
(20)	Group for peanut butter		76	83	93
(16)	Library procedures		55	79	83

Mastery of Objectives I2,3, & 4: Know how to develop, evaluate, & improve menus

Item		Percent Correct Exercise	A	B	C
(3)	Muffin for cake (fat)		48	76	93
(8)	A cycle menu is		40	55	62
(9)	Which menu has appeal		62	79	86
(10)	What should be added		21	45	66
(11)	Good breakfast		14	10	45
(13)	Color contrasts		41	52	90
(15)	Choice for Monday lunch		14	31	48
(17)	3 weeks for cycle		10	28	52

Mastery of Objectives II1 & 2: Know about cutting costs in the kitchen

Item		Percent Correct Exercise	A	B	C
(4)	Tips for economy		41	59	62
(18)	Good meat alternate		86	86	93

Participants in the **Menu Planning and Kitchen Economy** workshop had trouble answering questions about cycle menus and about tips for kitchen economy. Items 8, 15, and 17 probed knowledge about cycle menus. Average percents correct for these items before, during, and after the workshop were 21, 38, and 54 (20 percent correct is what would be expected if everyone simply guessed at the correct answer to a given item). These figures indicate that the curricula was effective in teaching some of the workshop participants what they need to know about cycle menus. But, half of the workshop participants did not learn cycle menu concepts from this workshop curriculum.

There was only one item inquiring about tips for kitchen economy (item 4). The percent correct for this item rose from 41 before the workshop to 62 after the workshop, indicating that some of the participants learned the tips. Inspection of the incorrect responses to item 4 showed that even after the workshop approximately 20 percent of the participants don't know that homemade breads and muffins cost less than commercially purchased products.

Item 12 was also a problem for the workshop participants. After the workshop, there were still approximately 15 percent of the participants who did not know that it is wise to limit the amount of salt in children's diets, and another 15 percent who did not know that it is important for children to eat carbohydrates every day. Only about half of the participants correctly responded that it is not necessary for children to eat red meat every day. This response pattern perhaps reflects an overriding concern for children's needs for protein. Results of the test administered in the **Nutrition and the Preschool Child** workshop prompted a similar conclusion.

Item 11 required that participants recognize that a hamburger with lettuce and tomato served with a glass of milk is as good a choice for breakfast as is a menu of egg, juice, toast, and milk. Less than half of the workshop participants were willing to acknowledge that a hamburger is a good breakfast choice. Recent research suggests that people think about foods in meal groups rather than basic food groups. This item may be inappropriate, therefore, for probing knowledge about the importance of variety in the diet.

Using a variety of colors and textures to make meals appealing was a content area in which the curriculum demonstrated strength. Items 9 and 13 probed knowledge in this area. Average percents correct for these items before, during, and after the workshop were 52, 66, and 88. Vitamin and mineral content of foods was another area of strength. Items 5, 6, and 19 probed this area. Average percents correct before, during, and after the workshop were 49, 74, and 87.

Even before the workshop, mastery had been achieved in the content area concerning meats and meat alternates. Average percents correct for items 18 and 20 which probed knowledge in this area were 81, 85, and 93.

PARTICIPANTS HAD MASTERED ALL OF THE ATTITUDE OBJECTIVES BEFORE THE MENU PLANNING AND KITCHEN ECONOMY WORKSHOP, BUT WERE EVEN MORE POSITIVE AFTER THE WORKSHOP.

Mastery of Objective I1: Believe food service staff should know and promote the principles of good nutrition

Item	Average Score Before	After
(1) Should know vitamin & mineral content	4.7	4.9
(2) Should encourage trying new foods	4.7	4.8
(6) Feelings about library	4.0	4.6

Mastery of Objectives I2,3, 4: Believe menus should be planned to be nutritious & appealing

Item	Average Score Before	After
(3) Menus should provide C & iron daily	4.5	4.6
(4) Menus should avoid high fat and sodium	4.1	4.4
(5) Variety encourages children to eat	4.3	4.6

Participants had mastered all of the attitude objectives before the **Menu Planning and Kitchen Economy** workshop, but were even more positive after the workshop. They accepted that food service staff should know the vitamin and mineral content of foods and should encourage children to try new foods. They were slightly less positive about the importance of planning menus to provide vitamin C and iron daily , to avoid high fat and sodium content, and to include a variety of foods. Still, all of their responses fell very close to the top of the 5-point attitudes scale.

Effects of the Kitchen Math and Food Purchasing Curriculum

The trend was toward increased knowledge and more positive attitudes after participation in the workshop.

	Average Score		
Scale	Before	During	After
Knowledge	54	79	88
Attitudes	3.7		4.1

EFFECTS OF THE KITCHEN MATH AND FOOD PURCHASING CURRICULUM

The trend was toward increased knowledge and more positive attitudes after participation in the workshop. Percent correct on the posttest and the follow-up test exceeded the mastery criterion. Because the average probability of correct item response on the pretest was only 54 percent, the apparent gain in knowledge was substantial. However, the statistical significance of the change could not be determined because there were too few cases on which to base the decision. Attitudes reported for the time after the workshop exceeded the mastery criterion whereas the average score reported for the time before the workshop was below the mastery criterion. This apparent gain was not statistically reliable, however.

There were 7 **Kitchen Math and Food Purchasing** workshops conducted between January and July 1985. Seven of the 22 workshop trainers conducted these half-day sessions for groups of participants ranging from 5 to 14. The participant total was more than 70 individuals, 33 percent of them food service personnel working in non-profit child care centers, 33 percent child care center educational staff, and 33 percent other individuals.

Follow-up knowledge tests were mailed to 25 of the workshop participants. Eight completed tests were returned. Three of these were marked with SSNs that could be matched to the pre- and post-test records. Because this number was so small, the average percents correct for items on the knowledge test were calculated using all 8 of the follow-up tests and data from 36 individuals whose SSNs could be matched on the pre- and post-tests.

Attitude questionnaires were mailed to 25 workshop participants. Fourteen completed questionnaires were returned.

PARTICIPANTS IN THE KITCHEN MATH AND FOOD PURCHASING WORKSHOP HAD TROUBLE ANSWERING QUESTIONS ABOUT WHAT INFORMATION THEY MUST HAVE BEFORE THEY CAN CALCULATE THE AMOUNT OF FOOD NEEDED.

Mastery of Objectives I2 & 4: Know the principles of math related to food purchasing

Item	Percent Correct Exercise	A	B	C
(1) Decimal numbers		72	89	99
(2) Hundredths place		31	64	63
(3) A proportion is		19	58	75
(4) Solving proportion		39	97	99
(5) Why use decimals		75	89	99
(8) Analyzing proportions		64	64	50
(9) Why proportions		61	86	99
(11) Quarts & gallons		70	99	88
(12) Solve ratio		64	89	99
(13) Largest fraction		86	94	99

Mastery of Objectives III & 2: Know how to calculate amounts of food needed

Item	Percent Correct Exercise	A	B	C
(6) Needed for calculating		25	31	62
(7) Why Food Buying Guide		58	83	88
(10) Sections of Buying Guide		39	72	99
(14) Milk for 65		72	89	99
(15) Beef for 50		33	82	99

Participants in the **Kitchen Math and Food Purchasing** workshop had trouble answering a question about what information they must have before they can calculate the amount of food needed. Many of the participants incorrectly responded that they would have to know both the number of children and the number of servings needed before they could calculate the amount of food (item 6). Performance on item 8 also failed to reach the mastery criterion. More than a quarter of the workshop participants incorrectly responded that all units of measure have to be the same for all ingredients in order to solve a proportion problem. Item 2 was the only other item for which performance did not reach the mastery criterion. The majority of participants who missed this item confused "hundreds" with "hundredths".

In all other areas, the curriculum appeared to be strong. The pretest scores were below the mastery criterion on almost all of the items, indicating a need for knowledge in all the content areas. The curriculum was especially strong in helping participants master calculation problems. Items 4, 12, 14, and 15 required calculations. The average percents correct before, during, and after the workshop for these items were 52, 89, and 99. The curriculum was also strong in helping participants become familiar with the Food Buying Guide for Child Care Food programs. The average percents correct for items 7 and 10 which probed knowledge about the guide were 49, 78, and 94.

ATTITUDES REPORTED AFTER THE KITCHEN MATH AND FOOD PURCHASING WORKSHOP SUGGEST THAT PARTICIPANTS MAY NOT BE MOTIVATED TO PRACTICE THE SKILLS THEY LEARNED DURING THE WORKSHOP.

Mastery of Objectives I1, 2, 3 & 4: Believe food service staff should know and use kitchen math

Item	Average Score Before	After
(1) Important to calculate fractions/decimals	3.9	4.4
(2) Should calculate to adjust recipes	3.9	4.0
(3) Calculating saves money	4.1	4.3

Mastery of Objective II1: Be motivated to use the Food Buying Guide for Child Nutrition Programs

Item	Average Score Before	After
(4) Guide is helpful	3.3	3.9
(5) Guide is easy to use	3.4	3.9
(6) Feelings about library	3.6	3.8

Attitudes reported after the **Kitchen Math and Food Purchasing** workshop suggest that participants may not be motivated to operate on the knowledge they acquired during the workshop. They expressed positive attitudes toward the importance of being able to calculate math problems involving fractions and decimals. They also agreed with the idea that calculating amounts of food needed is a money saving activity. But they did not stongly endorse the need for calculating amounts of ingredients to adjust recipes to meet requirements for their center. Attitudes toward the utility and simplicity of the food buying guide did not reach the mastery criterion, although they were slightly more positive after the workshop than before.

It did not appear that this workshop curriculum had any affect on attitudes toward the NET lending library collection.

DISCUSSION

THE NET WORKSHOP CURRICULA HELPED EDUCATORS AND FOOD SERVICE STAFF MASTER NUTRITION-RELATED KNOWLEDGE AND ATTITUDE OBJECTIVES.

* WORKSHOPS INCREASED KNOWLEDGE ABOUT NUTRITION FUNDAMENTALS, NUTRITION EDUCATION, AND FOOD SERVICE MANAGEMENT.

* POSITIVE ATTITUDES TOWARD NUTRITION EDUCATION AND FOOD FOOD SERVICE MANAGEMENT WERE ENHANCED BY THE WORKSHOPS.

* THE WORKSHOPS CONVEYED NUTRITION-RELATED INFORMATION TO APPROXIMATELY 1,500 EDUCATORS AND FOOD SERVICE STAFF BETWEEN JANUARY AND JULY, 1985.

DISCUSSION

The NET workshop curricula helped educators and food service staff master nutrition-related knowledge and attitude objectives. In all four of the workshops evaluated in this study knowledge test scores were higher and attitudes were more favorable after the workshops than before. These gains were achieved in all of the target content areas. After the workshops, participants knew more about nutrition fundamentals, nutrition education, and food service management. They held more positive attitudes toward nutrition education and food service management.

The nutrition-related information conveyed in the workshops reached substantial numbers of individuals in the target population. Between January and July of this year there were 105 workshops conducted--74 of them targeted for teachers and 31 of them for food service personnel. Nearly 80 percent of the approximately 1,650 individuals participating in these workshops were educators in non-profit child care centers. More than 10 percent were food service staff of child care centers and residential institutions.

The workshops provided information and incentives that educators need in order to implement effective nutrition learning activities for the children. The workshops also helped to shape knowledge and attitudes of food service workers so that they are better prepared to manage food service so that children have the opportunities to practice good eating habits. These data provide evidence that the workshops are helping to ensure that the children of Texas have opportunities to learn about and to practice good eating habits.

WORKSHOP CURRICULA WERE AT THE RIGHT LEVEL OF CHALLENGE FOR THOSE PARTICIPATING.

* BEFORE THE WORKSHOPS, KNOWLEDGE TEST SCORES WERE BELOW THE MASTERY CRITERION.

* AFTER THE WORKSHOPS, KNOWLEDGE TEST SCORES AND ATTITUDE SCALE VALUES MET MASTERY CRITERIA.

* OPERATIONAL KNOWLEDGE ACQUIRED DURING THE WORKSHOPS APPARENTLY IS BEING REINFORCED BY PRACTICE AFTER THE WORKSHOPS.

Workshop curricula were at the right level of challenge for those participating. Before the workshops, knowledge test scores in three of the four workshops were well below the mastery criterion, indicating that participants were not well informed in the content areas covered in the workshops. Test performance was considerably improved at the end of the workshop. At the two-months follow-up, criterion level performance was maintained or improved upon for all four of the workshops. The magnitude and statistical reliability of these changes provide evidence that the instructional process covers each of the content areas in ways that facilitate learning.

One of the more interesting results of this study is the finding that knowledge improved after the workshops. These gains were in content areas in which mastery is dependent on operational knowledge. Nutrition fundamentals is a content area whose mastery requires more factual than operational knowledge. Factual knowledge can decay over time unless it is reinforced with additional training. Knowledge about nutrition education and food service management, on the other hand, is operational knowledge. Operational knowledge is enhanced by practice. If educators and food service personnel use the nutrition education and food service management concepts taught in the workshops, they will discover more about those concepts and their knowledge will improve. The gain in knowledge scores in the two months after the workshop was in these two content areas. The improvement in knowledge test scores after the workshop is perhaps indicative that participants are learning by doing.

Attitudes toward nutrition education and food service management were already positive before the workshop. Nonetheless, in all four of the workshops evaluated in this study there were gains on the attitude scales. These changes, though small, were statistically reliable for three of the workshops. It appears that the instructional process enhanced participants' already positive attitudes.

THERE ARE AREAS WHERE CURRICULUM PERFORMANCE CAN BE IMPROVED.

* TRAINERS CAN BE ALERTED TO THE POSSIBLITY OF PROBLEMS CONCERNING THE ROLE OF PARENTS IN NUTRITION EDUCATION, CHILDREN'S NUTRIENT NEEDS, TIPS FOR KITCHEN ECONOMY, AND INFORMATION NEEDED TO CALCULATE AMOUNTS OF FOOD.

* CURRICULUM CHANGES MAY BE NEEDED TO HELP PARTICIPANTS MASTER CYCLE MENU CONCEPTS.

There are areas where curriculum performance can be improved. Informing workshop trainers about results of this study will mitigate the majority of problems that were detected. Trainers should be aware that participants' in nutrition education workshops may be confused about parents' role in their children's nutrition learning. They also should be alerted to the possibility that there is an an overriding concern about children's needs for protein that can interfere with learning other nutrition fundamentals.

Trainers in food service management workshops should be alerted to the fact that even after participating in kitchen economy sessions, substantial numbers of workshop participants don't know that homemade breads and muffins cost less than commerical varieties or that products sold in large size containers can cost more per unit than when they are sold in smaller containers. Trainers also should be informed that after learning kitchen math, workshop participants have more positive attitudes about their need to know how to apply their skills than about actually using these skills. They also have more difficulty learning what information they will need in order to calculate amounts of food needed than they have learning the actual calculation procedures.

Curriculum changes may be needed to help participants of the **Menu Planning and Kitchen Economy** workshop master cycle menu concepts. This was the only coherent content area in which knowledge test performance was consistently below the mastery criterion. After the workshop, more than 30 percent of the partcipants still did not know that cycle menus should last at least three weeks, that they can be modified often, and that marinated chicken or dried beans are poor choices for the first Monday in the cycle.

STEPS CAN BE TAKEN TO IMPROVE THE DIAGNOSTIC CAPABILITIES OF THE KNOWLEDGE TESTS AND ATTITUDE SCALES.

* ATTITUDE SCALES NEED TO BE REVISED TO INCREASE MEASUREMENT RELIABILITY.

* THE MENU PLANNING AND KITCHEN ECONOMY KNOWLEDGE TEST NEEDS TO BE EDITED TO REMOVE APPARENT CULTURE BIAS.

* THE FOOD...EARLY CHOICES KNOWLEDGE TEST NEEDS TO BE REVISED TO INCREASE MEASUREMENT RELIABILITY.

* ITEMS NEED TO BE REVISED TO TIGHTEN THE FOCUS OF THE NUTRITION AND THE PRESCHOOL CHILD KNOWLEDGE TEST.

Steps can be taken to improve the diagnostic capabilities of the knowledge tests and attitude scales. The most pressing need is for increased measurement reliability for the attitudes scales. The response alternatives can be rewritten to increase the probability that participants will use a wider range of scale values instead of using only the top half. Another way to increase reliability is to increase the number of items on the scales.

Revising the **Menu Planning and Kitchen Economy** knowledge test to remove apparent culture bias is another pressing need. Removing culture bias from the test not only will improve its diagnostic capability but also improve its utility as a learning activity during the workshop.

Reliability of the knowledge test for the **Food...Early Choices** workshop needs to be improved. A more reliable test is needed before firm conclusions can be drawn about the level of challenge in that workshop.

The focus needs to be tightened for the **Nutrition and the Preschool Child** knowledge test. Such tightening should provide better information about relative mastery of nutrition fundamentals and nutrition education concepts.

APPENDIX B

EVALUATION REPORT

SURVEY OF NUTRITION EDUCATION ACTIVITIES IN CHILD CARE CENTERS THAT HAD AND HAD NOT PARTICIPATED IN THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP

MARCH TO SEPTEMBER 1985

EXECUTIVE SUMMARY

THE CURRICULUM OF THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP APPEARS TO BE PERFORMING WELL IN PROMOTING USE OF RECOMMENDED INSTRUCTIONAL RESOURCES, BUT THERE ARE AREAS WHERE IMPROVEMENTS CAN BE MADE.

DIMENSIONS OF NUTRITION EDUCATION	PERCENTAGE OF CENTERS	
	WORKSHOP PARTICIPANTS	NON-PARTICIPANTS
LEARNING TIME ALLOCATED	94	80
INSTRUCTIONAL CONTENT:		
COOKING ACTIVITIES	81	83
FOOD SOURCES	94	84
FOOD AND HEALTH	100	92
INSTRUCTIONAL RESOURCES USED:		
RECOMMENDED CURRICULUM GUIDE	50	0
NET LENDING LIBARY COLLECTION	12	0
FOOD SERVICE STAFF	50	8

EXECUTIVE SUMMARY

The curriculum of the **Nutrition and the Preschool Child** workshop appears to be performing well in promoting use of recommended instructional resources, but there are areas where improvements can be made. The workshop is one way in which the federally funded Texas Nutrition Education and Training (NET) Program reaches children with opportunities to learn good eating habits. By providing preschool teachers with information about the fundamentals of nutrition and about how to convey this information so as to motivate children to eat right, the workshop facilitates effective nutrition education for the children.

In order to assess the impact of the workshop curriculum and to identify areas where improvements can be made, nutrition education activities were surveyed in samples of child care centers that had and had not participated in the workshop. Questionnaires inquiring about time spent, topics covered, and resources used to support nutrition education activities were mailed to all 46 of the centers that had participated in the workshops conducted January through March 1985 and to 50 child care centers selected at random from the population of non-profit child care centers that had not participated in the workshop.

Because there was no way to assure that there were no prior differences in the groups of centers (e.g., centers that take advantage of the opportunity to participate in the workshops may have more interest in nutrition and therefore already practice more effective nutrition education than centers that do not elect to participate in the workshops), and because the number of centers returning completed questionnaires was small (17 workshop centers and 15 comparison centers), it was not possible to determine conclusively what effects the workshop had on participant behavior. However, the pattern of differences between workshop and comparison centers was useful in diagnosing areas where improvements can be made.

Almost all of the workshop centers and most of the comparison centers had spent one or more hours on nutrition education activities in the 30 days prior to receiving the questionnaire. There were no differences between groups in time spent or topics covered. The average was five hours of nutrition education activities. Classroom instruction on the relationship between food and health was the topic most often included in the nutrition curricula. There were differences in use of recommended instructional resources: involving food service staff was a notable strength of nutrition education activities in workshop centers; few of the comparison centers reported involving their food service staff. Neither group was a frequent user of the NET lending library collection.

Areas where curriculum performance can be improved are in promoting use of the NET lending library collection and encouraging teachers to increase the amount of learning time allocated for nutrition education activities.

BACKGROUND

NUTRITION AND THE PRESCHOOL CHILD IS A WORKSHOP FOR TEACHERS OFFERED THROUGH THE TEXAS NUTRITION EDUCATION AND TRAINING (NET) PROGRAM TO PROVIDE INFORMATION ABOUT THE FUNDAMENTALS OF NUTRITION AND ABOUT HOW TO CONVEY THIS INFORMATION TO CHILDREN SO AS TO MOTIVATE THEM TO EAT RIGHT.

NUTRITION AND THE PRESCHOOL CHILD:
A WORKSHOP FOR TEACHERS

LEARNING OBJECTIVES

GIVEN WORKSHOP INFORMATION AND EXPERIENCE, TEACHERS WILL BE ABLE TO:

* ASSOCIATE SPECIFIC LEARNING SITUATIONS WITH BASIC NUTRITION CONCEPTS;
* PREPARE NUTRITION EDUCATION LESSON PLANS;
* DEVELOP CLASSROOM COOKING ACTIVITIES;
* EVALUATE NUTRITION EDUCATION ACTIVITIES.

BACKGROUND

Nutrition and the Preschool Child is a workshop for teachers offered through the Texas Nutrition Education and Training (NET) Program to provide information about the fundamentals of nutrition and about how to convey this information to children so as to motivate them to eat right. The provision of this kind of training is a stated objective of the federal legislation through which the Texas NET Program is funded. By promoting implementation of effective nutrition education in preschool classrooms, the workshop helps achieve the program goal of assuring that children have opportunities to learn and to practice good eating habits.

The workshop curriculum is designed to help teachers acquire knowledge and skills that enable them to prepare nutrition education lesson plans and to develop and evaluate cooking and other activities that provide opportunities for children to learn good eating habits. The desired outcome of the workshop is that teachers implement effective nutrition education activities in preschool classrooms.

The workshop is available free of charge to non-profit child care centers and institutions. Workshops are conducted in the participants' own communities by registered and licensed dietitians who live in the community. The six-hour curriculum is scheduled for a full-day or for two half-day sessions on dates arranged by the workshop trainers in compliance with requests from the participating centers. Training provided in the workshop meets Texas Department of Human Services (DHS) requirements for continuing education for staff of licensed day care centers.

Between January and March 1985, 11 **Nutrition and the Preschool Child** workshops were conducted at sites throughout Texas. There were 46 child care centers represented in these workshops.

THIS STUDY WAS CONDUCTED TO DETERMINE HOW WELL THE CURRICULUM OF THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP PERFORMS AS A FACILITATOR OF EFFECTIVE NUTRITION EDUCATION FOR PRESCHOOL AGED CHILDREN.

* HOW MUCH TIME IS ALLOCATED FOR NUTRITION EDUCATION ACTIVITIES?

* WHAT TOPICS ARE COVERED IN NUTRITION EDUCATION ACTIVITIES?

* WHAT RESOURCES ARE USED TO SUPPORT NUTRITION EDUCATION ACTIVITIES?

* WHAT DIFFERENCES ARE THERE IN NUTRITION EDUCATION ACTIVITIES IN CENTERS THAT HAD AND HAD NOT PARTICIPATED IN THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOPS?

This study was conducted to determine how well the curriculum of the **Nutrition and the Preschool Child** workshop performs as a facilitator of effective nutrition education for preschool aged children. Questionnaires inquiring about nutrition education activities conducted in preschool classrooms were mailed to the directors of day care centers that had and had not participated in the workshops.

Data were collected on three dimensions of nutrition education. First, information about the number of hours devoted to nutrition education was requested. Recent research of instructional processes indicates that time allocated is a good predictor of children's academic performance in specific topic areas--the more time devoted to the topic, the better the children's performance. Information about time allocated to nutrition education activities in centers that had and had not participated in the workshops was essential, therefore, in determining the extent to which the workshop promoted effective nutrition education in preschool classrooms. Other dimensions were topics covered and resources used to support nutrition education activities. This information was needed to identify areas of strength in the workshop curriculum and to identify areas where improvements can be made.

PROCEDURES

QUESTIONNAIRES WERE MAILED TO A SAMPLE OF CHILD CARE CENTER DIRECTORS TO COLLECT DATA ON TIME SPENT, TOPICS COVERED, AND RESOURCES USED FOR NUTRITION EDUCATION ACTIVITIES FOR PRESCHOOL AGED CHILDREN.

NUTRITION EDUCATION QUESTIONNAIRE

1. Please estimate the average number of hours per classroom that nutrition education activities have been conducted for preschool aged children at your center during the last 30 days. Please make your estimate by adding the number of hours per class and then dividing by the number of classes.

   For example, if there are three preschool classes at your center and in one of them four hours were spent on nutrition education and in another two hours were spent on nutrition education and in the third class there were no nutrition education activities during the last 30 days, you would add 4 + 2 + 0 and then divide by 3. In this example, the final estimate would be 6/3 = 2 hours. Please write the estimate for your center in the spaces below:

_____	/	_____	=	_____
Total Number of Hours		Number of Classes		Average Number of Hours

2. In the past 30 days, how did a typical class at your center divide their nutrition education time among the following activities?

   a. cooking activities involving the children _____ hours

   b. classroom instruction about foods (basic four food groups, recognizing foods, where food comes from, sensory attributes of food, food grouping)..... _____ hours

   c. classroom instruction about the relationship between food and health (food for growth, dental care, sanitation)..... _____ hours

   d. other (please specify) _____
   _____
   _____ _____ hours

   _____ Total

3. What resources did your center use to support preschool nutrition education activities during the last 30 days? CIRCLE the answer you choose beside each of the resources listed.

   a. curriculum guide..... yes no
   (if yes, please identify) title _____
   _____
   publisher _____
   _____
   _____

   b. films or other materials borrowed from the NET Lending Library Collection..... yes no

   c. presentations by members of the center's food service staff..... yes no

   d. other..... yes no
   (if yes, please describe) _____
   _____

This completes the questionnaire. If you have additional comments or questions, please write them in the space below. Use the postage-paid envelope to return the completed questionnaire. Thank you for your help!

Comments:

PROCEDURES

DATA COLLECTION

Questionnaires were mailed to a sample of child care center directors to collect data on time spent, topics covered, and resources used for nutrition education activities for preschool aged children. Questionnaires were sent to all 46 of the centers that participated in the **Nutrition and the Preschool Child** workshops conducted January through March 1985 and to 50 non-profit child care centers randomly selected from the population of licensed, non-profit child care centers that had not participated in the workshops. Of this original sample, 4 of the centers that had participated in the workshops and 4 of those in the comparison group had either closed or provided incorrect addresses and so were dropped from the sample. Completed questionnaires were received from 17 (40 percent) of the 42 remaining workshop participants and 15 (33 percent) of the 46 remaining comparison group centers.

The questionnaires were mailed approximately two months after the workshops were conducted and asked that directors provide information about nutrition education activities conducted during the 30 days just prior to receiving the questionnaire. Because the initial return rate for the questionnaires was very low, a reminder letter and another copy of the questionnaire were mailed to centers that had not responded by August 1985. Information provided by the directors represents, therefore, 30-day curriculum windows in the period from March to September 1985.

Center directors were asked to estimate the average number of hours per preschool classroom spent on nutrition education activities. They also were asked to indicate how the time was distributed across different activities. The topics listed on the questionnaire--cooking activities, classroom instruction about foods and food sources, and classroom instruction about the relationship between food and health--are the three major content areas covered in **A Preschool Nutrition Curriculum**, the one recommended and demonstrated during the workshop. The questionnaire item soliciting information about how time was distributed across different activities invited the directors to add topic areas to the list and indicate the relative amount of time devoted to "other" nutrition education activities.

The final item on the questionnaire inquired about resources used to support nutrition education activities. The three resources listed--curriculum guide, materials from the NET lending library collection, and food service staff--are resources that are advocated during the workshop. Assuring active involvement of food service staff in nutrition education activities is one of the objectives of the federal legislation through which the Texas NET Program is funded. This final questionnaire item invited the directors to indicate what other resources had been used in their centers to support nutrition education for preschool aged children.

Data Analysis

Data were analyzed by cross-tabulating workshop participation and responses to questionnaire items.

* To determine how much time was spent on nutrition education activities, average allocated learning time was calculated for workshop and comparison centers.

* Percentage of centers indicating "yes" to specific questionnaire items was calculated to determine what topics were covered and what resources were used to support nutrition education activities.

* Cross-tabulations of workshop participation and occurrence of "yes" responses to specific questionnaire items were inspected to identify possible differences in nutrition education activities in centers that had and had not participated in the workshops.

DATA ANALYSIS

Data were analyzed by cross-tabulating workshop participation and responses to questionnaire items. The pattern of responses then was examined to draw conclusions about performance of the workshop curriculum. The ideal pattern would show a large number of hours spent on nutrition education, balanced coverage of all three of the specified content areas, and use of all three of the specified instructional resources. If the pattern in the group of workshop participants was closer to the ideal than was the pattern evidenced in the comparison group, it can be concluded that the workshop curriculum performs well. Areas of strength and areas where improvements may be needed were diagnosed by comparing the pattern observed in the group of workshop participants against the ideal.

In order to determine how much time was spent on nutrition education activities, average allocated learning time was calculated. The percentage of centers indicating "yes" to specific questionnaire items was calculated to determine what topics were covered and what resources were used to support nutrition education activities. Cross-tabulations of workshop participation and occurence of "yes" responses of specific questionnaire items then were inspected to identify possible differences in nutrition education activities in centers that had and had not participated in the workshop.

LIMITATIONS

DESPITE DESIGN LIMITATIONS, THIS STUDY PROVIDED DATA TO ESTIMATE IMPACT AND DIAGNOSE AREAS FOR IMPROVEMENT.

- SAMPLE SIZE WAS SMALL AND DATA MAY NOT BE REPRESENTATIVE OF NUTRITION EDUCATION ACTIVITIES IN THE POPULATION OF DAY CARE CENTERS.

- POSSIBLE SELF-SELECTION BIAS AND LACK OF INFORMATION ABOUT NUTRITION EDUCATION ACTIVITIES CONDUCTED BEFORE THE WORKSHOPS CONSTRAIN DEFINITIVE CONCLUSIONS ABOUT EFFECTS ON BEHAVIOR.

- THE PATTERN OF NUTRITION EDUCATION ACTIVITIES REPORTED IS USEFUL IN ESTIMATING EFFECTS AND DIAGNOSING AREAS WHERE IMPROVEMENTS CAN BE MADE.

LIMITATIONS

Despite design limitations, this study provided data to estimate impact and diagnose areas for improvement. There were two ways in which the design was limited. First, limitations were imposed by the small sample size. The questionnaire return rates of 40 percent and 33 percent for workshop and comparison centers respectively were about average. The return rate for other mailed questionnaires associated with this workshop was 35 percent during 1985. However, the number of centers participating in the workshops was small relative to the number in the population of licensed day care centers in Texas. The number of centers returning questionnaires is an even smaller set of the population. The degree to which nutrition education activities conducted in this small set of centers is truly representative of nutrition education as practiced in day care centers in general is not known, but is likely that responding centers place a somewhat higher priority on nutrition education.

Second, because of possible self-selection bias in the group of workshop participants (i.e., the centers that elected to participate in the workshops may have had more interest and therefore been more active in providing nutrition education to their students even before the workshop than centers that elected not to participate) and because no information was available to describe nutrition education activities conducted in the participating centers before they participated in the workshop, it was not possible to apply inferential statistical procedures to evaluate the reliability of observed differences. In the absence of such procedures, it is not possible to state with conviction that differences observed between the workshop and comparison groups definitely were caused by the workshop curriculum, nor that they reflect actual population differences.

These characteristics of the research design mean that it is not possible to determine conclusively what effects the workshop curriculum had on participant behavior. However, the study provided data in an area where heretofore there were virtually none. The data are useful in developing preliminary ideas about the practice of early childhood nutrition education. The pattern of differences between centers that had and had not participated in the workshops is useful in formulating hypotheses about effects of the curriculum and diagnosing areas where improvements can be made.

RESULTS

ONE OR MORE HOURS HAD BEEN SPENT ON NUTRITION EDUCATION ACTIVITIES IN 94 PERCENT OF THE WORKSHOP CENTERS AND IN 80 PERCENT OF THE COMPARISON CENTERS.

HOURS SPENT ON NUTRITION EDUCATION	PERCENTAGE OF CENTERS	
	WORKSHOP PARTICIPANTS (N = 17)	NON-PARTICIPANTS (N = 15)
0	6	20
1 - 3	24	20
4 - 6	40	40
7 - 9	24	7
10 OR MORE	6	13

RESULTS

LEARNING TIME ALLOCATED

One or more hours had been spent on nutrition education activities in 94 percent of the workshop centers and in 80 percent of the comparison centers. There were no differences between groups in the amount of time allocated. In the 30 days sampled for each group of centers, the average amount of time devoted to nutrition education activities was five hours per classroom. These data may suggest that the majority of day care centers allocate one or more hours of nutrition learning time every 30 days. However, the director at one of the centers that had not conducted any nutrition education activities in the 30 days sampled volunteered the information that their preschool curriculum included a nutrition unit completed earlier in the year. This result suggests the alternative hypothesis that nutrition education is a periodic event which, when it occurs, consumes an average of five hours of allocated learning time.

Eight of the workshop centers and none of the comparison centers matched the ideal pattern on as many as five of the seven specified attributes of effective nutrition education. One of these eight matched the pattern exactly: a greater than average amount of time (seven hours) was devoted to nutrition education, all three of the specified topic areas were covered, and all three of the recommended resources were used.

CLASSROOM INSTRUCTION ABOUT THE RELATIONSHIP BETWEEN FOOD AND HEALTH WAS THE TOPIC INCLUDED MOST OFTEN IN THE NUTRITION EDUCATION CURRICULA IN BOTH GROUPS OF CENTERS.

Instructional Content			Percentage of Centers	
Cooking	Food Sources	Food & Health	Workshop Participants (N = 16)	Non-Participants (N = 12)
+	+	+	75	67
+	-	+	6	8
+	-	-	0	8
-	+	+	19	17

+ = YES - = NO

INSTRUCTIONAL CONTENT

Classroom instruction about the relationship between food and health was the topic included most often in the nutrition education curricula in both groups of centers. It was included in the curricula in all 15 of the workshop centers that had conducted nutrition education during the 30 days sampled, and it was included in the curricula of all but 1 of the 12 comparison centers that had conducted nutrition education activities in the 30 days sampled. Classroom instruction about food groups and food sources was included in the curriculum of 94 and 84 percent of the workshop and comparison centers, respectively. Cooking activities were a part of nutrition education curricula in 81 percent of the workshop centers and 83 percent of the comparison centers.

Balanced coverage of all three of the specified nutrition education topics occurred slightly more often in the workshop group than in the comparison group: 75 percent of the centers in the workshop group included all three topics and 67 percent of the comparison group included all three topics.

The director of one of the centers in the comparison group reported that the children had toured the food preparation facilities at Grandy's and McDonald's as part of their nutrition education curriculum. Other than the comment by one of the directors in the workshop group that opportunities are taken during meals to instruct the children about good eating habits, these tours were the only "other" topic indicated by either group of center directors.

PRESENTATIONS BY FOOD SERVICE STAFF WERE INCLUDED IN THE NUTRITION CURRICULA IN 50 PERCENT OF THE WORKSHOP CENTERS AND 8 PERCENT OF THE COMPARISON CENTERS.

Instructional Resources Used			Percentage of Centers	
Guide	NET Library	Food Service Staff	Workshop Participants (N = 15)	Non-Participants (N = 12)
+	+	+	6	0
+	-	+	38	8
-	+	+	6	0
+	-	-	38	75
-	-	-	12	17

+ = YES - = NO

INSTRUCTIONAL RESOURCES USED

Presentations by food service staff were included in the nutrition curricula in 50 percent of the workshop centers and 8 percent of the comparison centers. Encouraging a team approach to nutrition education that involves food service staff as well as teachers, students, and their parents is one of the objectives of the federal legislation through which NET is funded.

Only two (12 percent) of the workshop centers and none of the comparison centers had used materials available through the NET lending library. This low level of use is consistent with results of another study which showed that less than 1 percent of the population of NET workshop participants were users of the NET lending library collection.

The majority of centers in both the workshop group (82 percent) and the comparison group (83 percent) reported that a curriculum guide was used to support nutrition education activities for the the children.

Only one of the workshop centers and none of the comparison centers reported using all three of the specified instructional resources. Several of the center directors (20 percent of the workshop group and 42 percent of the comparison group) reported that teachers used resources that they found for themselves to support nutrition education activities in the classroom. This result converges with those of the needs assessment conducted during 1985 in public schools to suggest that in the absence of a coordinated program of support for nutrition education, teachers rely heavily on materials they find for themselves.

One of the centers in the control group reported that their curriculum had included presentations by personnel from the Army Nutrition Clinic. One of the centers in the workshop group indicated that resources had been borrowed from the local library and another reported that resources had been provided through the Cooperative Extension Service.

Three (20 percent) of the centers in the workshop group had used materials provided in NET workshops (e.g., **The Very Hungry Caterpillar** and **Chef Combo**) to support their nutrition education activities. Another study conducted during 1985 confirms that materials distributed through the NET program are useful additions to a center's instructional resources.

THE CURRICULUM GUIDE RECOMMENDED DURING THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP WAS USED IN 50 PERCENT OF THE WORKSHOP CENTERS AND IN NONE OF THE COMPARISON CENTERS.

CURRICULUM GUIDE USED	PERCENTAGE OF CENTERS	
	WORKSHOP PARTICIPANTS (N = 16)	NON-PARTICIPANTS (N = 12)
A PRESCHOOL NUTRITION CURRICULUM AND FOOD...EARLY CHOICES	25	0
A PRESCHOOL NUTRITION CURRICULUM	25	0
FOOD...EARLY CHOICES	19	17
ABEKA CHRISTIAN CURRICULUM	0	25
HEART ASSOCIATION	0	17
OTHER	13	25
NONE	19	17

The curriculum guide recommended during the **Nutrition and the Preschool Child** workshop was used in 50 percent of the centers that had participated in the workshops and in none of the centers that had not. Half of the directors who reported using **A Preschool Nutrition Curriculum** also used the guide that accompanies the **Food...Early Choices** kit. The kit, which is introduced in the NET workshop entitled **Food...Early Choices**, was used in two other workshop centers and two comparison centers.

Several (25 percent) of the comparison centers reported that they use the nutrition unit in the ABeka Christian Curriculum published by the Pensacola Christian College in Florida. Others (17 percent) used the heart unit provided by the American Heart Association. "Other" curriculum guides used in the workshop and comparison centers included **Winnie the Pooh: Nutrition and You** produced by Disney and **Tattletooth** published by the Texas Department of Health.

DISCUSSION

THE CURRICULUM OF THE NUTRITION AND THE PRESCHOOL CHILD WORKSHOP APPEARS TO BE PERFORMING WELL IN PROMOTING USE OF RECOMMENDED INSTRUCTIONAL RESOURCES, BUT THERE ARE AREAS FOR IMPROVEMENT.

* INVOLVEMENT OF FOOD SERVICE STAFF WAS A NOTABLE STRENGTH OF NUTRITION EDUCATION ACTIVITIES IN CENTERS THAT HAD PARTICIPATED IN THE WORKSHOP.

* AREAS WHERE THE CURRICULUM CAN BE IMPROVED ARE IN PROMOTING USE OF THE NET LENDING LIBRARY COLLECTION AND ENCOURAGING TEACHERS TO INCREASE THE AMOUNT OF LEARNING TIME ALLOCATED FOR NUTRITION EDUCATION.

DISCUSSION

The curriculum of the **Nutrition and the Preschool Child** workshop appears to be performing well in promoting use of recommended instructional resources, but there are areas where improvements can be made. Involvement of food service staff was a notable strength of nutrition education activities in centers that had participated in the workshops. Use of the recommended curriculum guide was also a factor that appeared to differentiate centers in the workshop group from those in the comparison group.

Although the two centers that had used materials borrowed from the NET lending library collection were in the workshop group, it appears that this is one area where performance of the workshop curriculum could be improved. Other studies of the NET program show that the workshop is effective in informing participants about procedures for borrowing from the collection and in persuading them that the collection is a very useful resource. Actual use of the library by workshop participants remains low, however. Additional efforts are needed to improve the workshop's capability to promote use of the library collection. Including a copy of the library's materials request form in the packet of workshop materials and/or incorporating in the curriculum an exercise in using the NET program media catalog to select appropriate materials could strengthen the curriculum in this area.

Another area where the curriculum can be improved is in encouraging teachers to increase the amount of learning time allocated for nutrition education activities. Although the number of centers (87 percent for workshop and comparison groups combined) that had conducted nutrition education activities in the 30-day periods that were sampled is heartening, the amount of learning time was small. In 24 percent of the workshop centers and 20 percent of the comparison centers that had conducted nutrition education activities, fewer than 4 hours per classroom were being devoted to the activities.

Because of design limitations in this study it was not possible to determine whether the hours reported represent a per month figure--that is, an average allocation of 5 hours per month--or whether nutrition is an isolated unit in the curriculum that, when it does occur, is allocated an average of 5 hours of learning time. Additional research is needed to show how many hours actually are spent on nutrition education in preschool classrooms and to show how much time is enough time to help the children learn good eating habits. Learning time is a sufficiently important variable in the formula for effective education, however, to justify the conclusion that the workshop should encourage teachers to increase the amount of time allocated for nutrition education.

APPENDIX C

EVALUATION REPORT

The Effects of Nutrition Education and Training on Day Care Center Menus

January through July 1985

ALTHOUGH THE CURRICULUM OF THE MENU PLANNING AND KITCHEN ECONOMY WORKSHOP PERFORMED WELL I SHAPING PARTICIPANTS' KNOWLEDGE AND ATTITUDES ABOUT EFFECTIVE MENU PLANNING, MENUS ACTUALLY USED I DAY CARE CENTERS HAD THE SAME STRENGTHS AND WEAKNESSES AFTER THE WORKSHOPS AS THEY HAD BEFORE.

ELEMENTS FOR WHICH AVERAGE PERCENT RECOMMENDED DIETARY ALLOWANCE (RDA) WAS LESS THAN 67

NUTRITIONAL ELEMENT	WORKSHOP PARTICIPANTS			NONPARTICIPANTS		
	BEFORE	6 WEEKS AFTER	12 WEEKS AFTER	BEFORE	6 WEEKS AFTER	12 WEEKS AFTER
FOOD ENERGY	**	**	**	**	**	**
PROTEIN						
VITAMIN A						
VITAMIN C						
RIBOFLAVIN						
THIAMINE	*	*	*	*	*	*
NIACIN	*	*	*	*	*	*
CALCIUM	*	*		*		*
IRON	**	**	**	**	**	**

BECAUSE THESE MENUS ARE FOR BREAKFAST (OR AM SNACK), LUNCH, AND PM SNACK, THEY ARE REQUIRED TO SUPPLY 50 PERCENT AND SHOULD SUPPLY 67 PERCENT RDA.

* = 50-66 PERCENT ** = 33-49 PERCENT *** = LESS THAN 33 PERCENT

EXECUTIVE SUMMARY

Although the curriculum of **Menu Planning and Kitchen Economy** performed well in shaping participants' knowledge and attitudes about effective menu planning, menus actually used in the day care centers had the same strengths and weaknesses after the workshops as they had before. The workshop is one element in the state's plan for achieving the federally stipulated goal of reaching all children with opportunities to learn about and to practice good eating habits. Its curriculum is designed to provide staff of nonprofit child care facilities with information about the fundamentals of nutrition and how to use this information to plan menus that are nutritionally balanced and appealing to preschool-aged children.

This study was conducted to determine the extent to which the workshop influences actual menu planning behavior in child care centers. Such information is needed in order to evaluate effects of the workshop and identify areas where the curriculum can be improved.

Menus were collected from 20 centers that had participated in the workshop and from a comparison group of 20 centers that could have participated but did not. Two-week sets of menus were obtained before the workshops, 6 weeks after, and again 12 weeks after workshops were conducted. Nutrient content of the meals and snacks described on the menus was examined in a computerized nutritional analysis. Sensory appeal of the combinations of foods served was evaluated by measuring variety of foods, colors, textures, temperatures, and flavors.

Results showed that the workshop had no effect on menus. The pattern of menu strengths and weaknesses was virtually identical for times before and after the workshops, irrespective of workshop participation. The menus provided adequate amounts of protein, vitamin A, and vitamin C. They were deficient in supplying food energy and iron. They earned high marks for variety of colors and temperatures but often presented combinations whose flavors lacked harmony.

Data from knowledge and attitude tests administered before and after the workshops were examined to develop hypotheses about why the menus were unaffected by staff training. Knowledge data showed that, with the exception of cycle menu concepts, participants had mastered the curriculum content. Their attitudes were quite positive before and reliably more positive after the workshop. Thus, the curriculum performed well in communicating information, but it did not have the desired effect on menu planning behavior.

In addition to improved training, other resources--such as preplanned cycle menus and standardized recipes--may be needed to help child care staff plan menus that encourage children to eat right.

BACKGROUND

MENU PLANNING AND KITCHEN ECONOMY IS A NUTRITION EDUCATION AND TRAINING WORKSHOP TO TEACH CHILD CARE FOOD SERVICE PERSONNEL HOW TO PLAN MENUS THAT ENCOURAGE CHILDREN TO EAT RIGHT.

WORKSHOP
LEARNING OBJECTIVES

1. GIVEN BASIC INFORMATION ABOUT LEADER NUTRIENTS AND THE FOUR FOOD GROUPS, PARTICIPANTS WILL RECOGNIZE LEADER NUTRIENTS AND IDENTIFY THE FOOD GROUP OF GIVEN FOODS.

2. GIVEN INFORMATION ON LEADER NUTRIENTS, CLASSIFICATION OF FOODS, AND MENU CYCLING, PARTICIPANTS WILL PREPARE A CHECKLIST FOR EVALUATING MENUS.

3. GIVEN A SAMPLE MENU FOR FEEDING CHILDREN, PARTICIPANTS WILL EVALUATE THE MENU AND MAKE NECESSARY CHANGES.

4. PARTICIPANTS WILL IMPROVE MENUS AND MAKE NECESSARY CHANGES TO MEET THE NUTRITIONAL NEEDS OF CHILDREN OR IMPROVE THE TASTE OR VISUAL APPEAL OF THE FOOD.

BACKGROUND

Menu Planning and Kitchen Economy is a nutrition education and training workshop designed to teach child care food service personnel how to plan menus that encourage children to eat right. The workshop is one of four food service workshops offered through the Texas Nutrition Education and Training (NET) program. Provision of this kind of training is a stated objective of the federal legislation through which the Texas NET program is funded. By promoting effective menu planning in child care facilities the workshop helps achieve the program goal of assuring that children have opportunities to learn about and to practice good eating habits.

The workshop curriculum is designed to help food service personnel acquire knowledge and skills required to plan menus that meet the nutritional needs of children and appeal to their visual and gustatory senses. Instruction and exercises are designed to help participants acquire knowledge about the ten "leader nutrients" (protein, carbohydrate, fat, vitamin A, vitamin C, thiamine, riboflavin, niacin, calcium, and iron), how to plan menus to meet nutrient needs of children, and how to evaluate and adjust menus to improve the taste or visual appeal of the food. The desired outcome of the workshop is improved menu planning behavior in child care facilities. When menus improve, children's opportunities to practice good eating habits are increased.

The workshop is available free of charge to licensed, nonprofit child care facilities. Workshops are conducted in the participants' own communities by registered and licensed dietitians who live in the community. The four-hour curriculum is scheduled on dates arranged by the workshop trainers in compliance with requests from the participating centers. Training provided in the workshop meets Texas Department of Human Services (DHS) requirements for continuing education for staff of licensed day care centers.

Between January and July 1985, 24 **Menu Planning and Kitchen Economy** workshops were conducted at sites throughout Texas. Ninety-nine child care centers were represented in these workshops.

A PRIOR STUDY SHOWED THAT THE WORKSHOP CURRICULUM PERFORMS WELL IN SHAPING PARTICIPANTS' KNOWLEDGE AND ATTITUDES ABOUT EFFECTIVE MENU PLANNING.

			Average Score		
Scale	Range	Criterion	Before	During	After
Knowledge	(20-100)	70	48	63	76
Attitudes	(1-5)	4.5	4.4		4.7

A prior study showed that the workshop curriculum performs well in shaping participants' knowledge and attitudes about effective menu planning. Knowledge test scores and attitude scale values were reliably higher after the workshops than they were before. On both sets of measures, the workshop participants surpassed a preset mastery criterion.

The knowledge tests, administered at the beginning and at the close of each workshop and mailed to a sample of the participants approximately two months after the workshop, provided information regarding mastery of both factual and operational knowledge of menu planning. An item asking participants to identify a food that is high in vitamin A is an example of a probe for factual knowledge. An item asking participants to evaluate a menu and recommend suitable changes to improve the nutritional value of the meal for a preschool-age child is an example of a probe for operational knowledge. Test scores indicated that, with the exception of cycle menu concepts, the curriculum facilitated mastery of knowledge objectives. The average percent correct rose from 48 to 76, a score which exceeded the preset mastery criterion of 70.

The attitudes questionnaire was mailed to a sample of participants approximately two months after workshops were conducted. The questionnaires asked respondents to use a five-point scale to report their current attitudes and then indicate what their attitudes were before the workshop. This procedure, called a retrospective pretest, provided data with which to assess the amount and direction of change in attitudes. Results showed that although attitudes were already favorable before the workshop, they were reliably more favorable after the workshop.

PURPOSE

THIS STUDY WAS CONDUCTED TO DETERMINE HOW WELL THE WORKSHOP CURRICULUM PERFORMS AS A FACILITATOR OF MENU PLANNING IN CHILD CARE CENTERS.

* ARE MENUS PLANNED SO THAT MEALS AND SNACKS PREPARED AND SERVED IN THE CENTER PROVIDE 50 TO 67 PERCENT OF THE RECOMMENDED DIETARY ALLOWANCE (RDA) OF NUTRIENTS FOR CHILDREN AGED 3 TO 5 YEARS?

* ARE MENUS PLANNED TO PROVIDE A VARIETY OF FOODS IN APPEALING COMBINATIONS OF FLAVORS, COLORS, TEXTURES, AND TEMPERATURES?

* ARE MENUS MORE NUTRITIONALLY BALANCED AND MORE APPEALING AFTER THE CENTER HAS PARTICIPATED IN THE WORKSHOP THAN THEY WERE BEFORE?

* IN WHAT AREAS DOES THE CURRICULUM FAIL TO FACILITATE SOUND MENU PLANNING?

PURPOSE

This study was conducted to determine how well the workshop curriculum performs as a facilitator of menu planning behavior in child care centers. Menus were collected before and after workshops were conducted from samples of licensed day care centers that had and had not participated in the workshops.

The menus were evaluated to determine whether meals and snacks prepared and served in the center meet the nutrient needs of children and whether the menus are planned to provide a variety of foods in combinations that are appealing. Comparisons were made for times before and after the workshops and for groups of centers that had and had not participated in the workshops. This information was needed to identify strengths and weaknesses in the menus and to determine what effects the curriculum had on menu planning behavior. Results of the analyses were used to identify areas where improvements can be made to help child care facilities plan better menus.

PROCEDURES

MENUS WERE OBTAINED FROM 20 LICENSED DAY CARE CENTERS THAT HAD PARTICIPATED IN MENU PLANNING AND KITCHEN ECONOMY WORKSHOPS AND FROM A COMPARISON GROUP OF 20 ELIGIBLE CENTERS THAT HAD NOT PARTICIPATED IN THE WORKSHOPS.

Texas Department of Human Resources

John H. Winters Human Services Center • 701 West 51st Street
Mailing Address: P.O. Box 2960 • Austin, Texas 78769

COMMISSIONER

BOARD MEMBERS
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Greetings:

Your center has been selected to participate in a computerized nutritional analysis of menus prepared and served in licensed day care centers. This analysis is part of an evaluation of the Texas Department of Human Resources's Nutrition Education and Training (NET) Program.

Your center participates in this analysis by sending us copies of daily menus for all meals and snacks prepared and served in the center Monday through Friday, June 3 through 7 , and Monday through Friday, June 10 through 14. These menus should have any substitutions recorded on them as stipulated in Section 6000, page 25, DHR 5-85, Minimum Standards, Day-Care Centers. Please mail the menus to us before July 10, 1985. A postage-paid envelope is enclosed.

Additional menus will be requested from your center in July and August. The analysis will be complete by the end of August, 1985.

Your center will receive a copy of the computer-generated report on your center's menus. The report will provide information about the calorie content, fat content, iron and sodium content, and vitamin A and C content of the meals and snacks described in the menus. If your center was to purchase this kind of computerized nutritional analysis to assist you in evaluating and improving your menus, it would cost approximately $100. The Texas NET Program is pleased to be able to provide your center with this service at no cost.

Thank you for your center's participation in this project.

Sincerely,

PROCEDURES

Menus were obtained from 20 licensed day care centers that had participated in **Menu Planning and Kitchen Economy** workshops and from a comparison group of 20 eligible centers that had not participated in the workshops. Approximately two weeks after workshops were conducted, letters were mailed to request menus describing all meals and snacks prepared and served in the center during a two-week (10-day) period approximately 2 weeks before workshops. Another set of menus was requested approximately 6 weeks after the workshop. A third set of menus was requested approximately 12 weeks after the workshop. These time intervals were selected to accommodate a reasonable lag between the learning of new skills and actually beginning to apply them. It seemed reasonable to expect that centers would continue to use menus they had already prepared through the completion of a cycle or to the end of a month. It also seemed reasonable to assume that, if they were going to apply what they had learned in the workshop, they would begin to make use of their new knowledge and skills within 6-12 weeks after the workshop.

Menus were requested from participants in 8 of the 24 **Menu Planning and Kitchen Economy** workshops that were conducted between January and July 1985. These workshops were selected to assure representation of different geographical areas of Texas. Twenty-eight of the centers that participated in these 8 workshops were invited to submit menus. Head Start centers, which do not operate during the summer and consequently would be unable to supply menus for all three of the selected time intervals, were excluded from the sample as were three centers in a community development program because their menus were planned at the program headquarters and were identical to those of a fourth center that did participate in this menu analysis project. Menu sets for all three of the specified time intervals were received from 20 of the 28 centers that were invited to submit menus. Another five sent one or two menu sets. One center had participated in the workshop but was not going to open until later in the year. Two centers failed to respond to any of the mailed requests for menus.

The comparison group was selected from the roster of nonprofit day care centers that had not participated in the workshops. The selection was random with the following constraints: they were matched with the workshop group on geographical area, and Head Start centers were excluded. Thirty-eight centers were invited to submit menus. Menu sets for all three of the specified time intervals were received from 20 of the 38 centers. Twelve of the remaining 18 centers indicated that they do not serve meals either because they operate from 8 to 11 am only or because the children bring sack lunches. The remaining 6 centers failed to respond to the mailed requests for menus.

CODING NUTRIENT CONTENT

STANDARD PORTION SIZES WERE ASSIGNED FOR ALL ITEMS FOR WHICH PORTIONS WERE NOT LISTED ON THE MENUS; THE MENUS THEN WERE SUBMITTED FOR COMPUTERIZED NUTRITIONAL ANALYSIS.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
A.M. SNACK	Grahams 10gm Milk ½c	Pancakes -1(30gm) Milk ½c	Oatmeal 13gm Made W/ Milk ½c	Waffles - 1 (30gm) Milk ½c	Iron Fortified Dry Cereals 13gm Milk ½c
LUNCH	Lasagna Lazana D-18 Tossed Salad ½c + 1tsp dressing Garlic Toast 13gm + ½ tsp marg Lemon Pudding ½c Punch ¾c	→ 1.6 oz Frank + 3Tbsp. Sauce B.B.Q. Weiner Pork & Beans ½c Pat. Chips ½ oz Fruit Cup 2oz Bread 13gm Punch ¾c	Fish Sticks 3-1oz French Fries ½c Seasoned Greens Beans ½c Bread 13gm Jello ½c Milk ¾c	→ ½c Potato + 1.5 oz Cheese Patato Bake ½ Buttered Corn ½c Bread 13gm Fresh Fruit ½ med. banana Milk ¾c	→ 1.5 oz beef + 1tsp + 2Tbsp Sauce Sloppy Joes French Fries ½c Carrot Stickes 1oz Cookies 18gm Punch ¾c
P.M. SNACK	Ritz 10gm Peanut Butter ¾ Tbsp Milk ½c	Mix: Cereal 10gm Nuts 1 Tbsp. Raisins 1 Tbsp Marshmellows 5gm.	Cheeses ½ oz Apple Jc. ½c	1oz Celery Stickes W/ Peanut Butter ¾ Tbsp. Orange Jc. ½c	Cheese ½ oz Crackers 10gm. Milk ½c

CODING NUTRIENT CONTENT

Standard portion sizes were assigned for all items for which portions were not listed on the menus; the menus then were submitted for computerized nutritional analysis. Portion sizes were assigned to meet minimum requirements of the U.S. Department of Agriculture's (USDA) Child Care Food Program (CCFP) meal patterns. Although it is possible that any given center actually serves more or less than the minimum portion, this procedure provided the consistency needed for computerized nutritional analysis. When reviewing results of the analysis, the reader can have confidence that, if the center is providing at least a minimum portion, the menu is supplying at least the amount of nutrients indicated in the data tables and printouts.

Computerized nutritional analysis of the menus was performed by Health Data Systems, Inc. (HDS), a company that specializes in nutritional analysis. There are over 14,000 food items in HDS's data base, which is updated every four to six weeks in response to new information published by USDA and information supplied by food manufacturers. The data base provides information needed to calculate the average daily amounts and percentage of Recommended Dietary Allowance (RDA) for food energy, protein, vitamin A, vitamin C, riboflavin, thiamine, niacin, calcium, and iron.

In order to assure comparability of results for different centers, only breakfast or morning snack, lunch, and afternoon snack were coded during the computerized nutritional analysis. Because these meals and snacks represent about two-thirds of the meals and snacks that a child would normally be served during the whole day, they should provide approximately 67 percent RDA.

Subjective review of the menus by registered/licensed dietitians who calculated the portion sizes indicated that some of the menus met CCFP minimum requirements for meal components and others did not. Not all of the centers participating in this study were CCFP participants. Differences in menus between CCFP and non-CCFP centers were not systematically explored in this study because of small sample sizes and limited study resources.

CODING SENSORY APPEAL

A CHECKLIST WAS DEVELOPED TO EVALUATE THE VARIETY OF FOODS, FLAVORS, COLORS, TEXTURES, AND TEMPERATURES REPRESENTED IN THE MENUS.

Section I. VARIETY OF FOODS — Menus for the week: _____

MEAT/MEAT ALTERNATES	VEGETABLES	BREADS/CEREAL
Beans	Beets	Bread/rolls ////
Beef //	Broccoli /	Cornbread
Eggs	Cabbage	Crackers //
Fish /	Carrots ///	Muffins
Franks/Bologna	Celery /	Pasta /
Peanut Butter	Corn	Popcorn
Pork	Green Beans /	Rice /
Poultry	Lettuce ///	Tortillas /
Other	Peas	Other
	Potatoes /	DAIRY PRODUCTS
FRUITS/FRUIT JUICES	Sweet Potatoes	Cheese ////
Apple	Spinach /	Milk //// ///
Banana //	Squash	Ice Cream
Grape /	Tomatoes /	Pudding
Orange	Mixed	OTHER FOODS
Peach /	Other	Butter ///
Pear		Cake/Pie
Pineapple		Cookie /
Plum		Gelatin
Raisins		Gravy
Mixed /		Punch
Other		Other

Section II. VARIETY OF SENSATIONS

Day: Tues
Date: 2-26-85

FLAVORS	
Harmonious	✓
COLORS	
Brown	/
Green	/
Red	/
White	//
Yellow/Orange	/
Mixed	
TEXTURES	
Chewy	//
Wet & Crisp	
Dry & Crunchy	
Smooth	
Soft	///
Liquid	
Other	
TEMPERATURES	
Hot/Warm	///
Room temperature	/
Chilled	/
Frozen	

CODING SENSORY APPEAL

A checklist was developed to evaluate the variety of foods, flavors, colors, textures, and temperatures represented in the menus. Section I of the checklist was used to evaluate the variety of foods used from food groups listed on the **Guide to Good Eating...A Recommended Daily Pattern**, a guide that is discussed during the workshop and given to workshop participants. The second section of the checklist was used to check dimensions of taste and visual appeal that are discussed during the workshop.

The checklists were completed by registered/licensed dietitians on the NET program staff. In section I of the checklist, the dietitian made at least one check mark for every item appearing on the menu for lunch and afternoon snack for all five days of one of the two weeks covered in the menu set. The only exceptions were for catsup, pickle relish, and parsley, which were not considered foods for purposes of this evaluation. Items with multiple parts were given check marks for each of the major ingredients. For example, a cheese enchilada earned checks for cheese and for tortilla. Variety of foods used was scored by counting the number of rows containing check marks within each food group in section I.

In section II, the dietitian checked dimensions of taste and visual appeal of the lunch on each of three days. The lunches earned checks for flavor only if they were judged to be harmonious. In the colors category, some items earned more than one check mark. A baked potato, for example, generated checks for brown and for white. All items, except beverages, on the three lunch menus were given one checkmark each for texture and for temperature. Variety of sensations was scored by counting the number of rows checked within categories and across days.

The checklist has face validity, and its content validity was checked during trial applications of the checklist to menus clinically diagnosed as good and poor. Its measurement reliability is not yet known because each of the dietitians completing the checklist for this study did so on different sets of menus. Even though further tests are needed to verify its validity and assess its reliability, this instrument provided useful, exploratory information about the sensory appeal of menus planned in day care centers.

Data Analysis

Results of the computerized nutritional analysis and the menu variety checklist procedure were analyzed to determine what changes occurred in the menus after centers participated in the Menu Planning and Kitchen Economy workshop.

- Average percentage of Recommended Dietary Allowance (RDA) was calculated and compared against criterion to identify strengths and weaknesses in nutrient content of the menus.
- Multi-attribute evaluation procedures were applied to analyze data obtained with the menu variety checklist.
- Analysis of variance with one within subjects factor (times before and after the workshops) and one between groups factor (workshop participation) was used to verify conclusions about what effects the curriculum had on the menus.

DATA ANALYSIS

Results of the computerized nutritional analysis and the menu variety checklist procedure were analyzed to determine what changes occurred in the menus after centers participated in the Menu Planning and Kitchen Economy workshop.

Average percentage of RDA was calculated and compared against criterion to identify strengths and weaknesses in nutrient content of the menus. If the menu was found to provide a given nutrient at an average of more than 67 percent RDA, it was categorized as ideal for that nutrient. This criterion accommodates the fact that breakfast, lunch, and afternoon snack account for approximately two-thirds of the meals and snacks a child would normally consume during the day. If the menu was found to provide 50 to 66 percent RDA, it was categorized as acceptable. DHS minimum standards for day care centers require that the meals and snacks served supply at least 50 percent RDA. Menus with percentage of RDA below 50 were categorized as "in need of improvement" if they supplied at least 33 percent RDA for the specified nutrient. They were categorized "unsatisfactory" if they supplied less than 33 percent RDA.

Multi-attribute evaluation procedures were applied to assign "utility" scores for each of the nutrients. These procedures placed the raw scores onto a common scale that runs from "terrible" to "ideal". In this case, the scale's lower bound (i.e. "terrible") was set as 0 and the upper bound (i.e. "ideal") was set at 67 percent RDA. Utility scores then were determined by transforming percent RDA for each nutrient to a percentage of the range on the terrible-to-ideal scale. The resulting scores are referred to as "utility scores". A nutrient utility score of 49, for example, means that the raw score was 33 percent RDA because 33 falls at 49 percent of the range from 0 to 67. A raw score of 187 percent RDA would be assigned a utility score of 100 because 18 falls beyond the upper bound or ideal raw score of 67 percent RDA. By transforming raw scores into units of utility, multi-attribute evaluation procedures enabled aggregation across nutrients without allowing an extraordinarily high percentage of RDA on some nutrients to balance out or obscure a low percentage of RDA on other nutrients.

Multi-attribute evaluation procedures also were applied to analyze data obtained with the menu variety checklist. The lower bound was set at 0 for each of the food groups and sensory attributes measured with the checklist. The upper bound was set at the highest value obtained for the given attribute. Raw scores then were transformed to percentage of range. Menus with utility scores below the midpoint of the scale (i.e. $U \leq 50$) were categorized as being in need of improvement. Those with utility scores above the midpoint were categorized as having acceptable levels of sensory appeal.

Utility scores for nutrient content and for sensory appeal were submitted to analysis of variance procedures with one within subjects factor (times before and after the workshops) and one between groups factor (workshop participation). This statistical analysis provided information to verify conclusions about changes in the menus that can be attributed to the workshop curriculum.

RESULTS

UTILITY SCORES FOR NUTRIENT CONTENT AND FOR SENSORY APPEAL WERE THE SAME FOR TIMES BEFORE AND AFTER THE WORKSHOP, IRRESPECTIVE OF WORKSHOP PARTICIPATION.

AVERAGE UTILITY SCORES

	WORKSHOP PARTICIPANTS			NON-PARTICIPANTS		
		6 WEEKS	12 WEEKS		6 WEEKS	12 WEEKS
SCALE	BEFORE	AFTER	AFTER	BEFORE	AFTER	AFTER
NUTRIENT CONTENT	78	79	80	80	81	80
SENSORY APPEAL	56	58	59	59	57	58

RESULTS

Utility scores for nutrient content and for sensory appeal were the same for times before and after the workshops and between groups, irrespective of workshop participation.

Close inspection of the utility scores suggests a possible positive trend on both the nutrient content and sensory appeal dimensions within the group of workshop participants. However, these small increments in utility were not systematic. Analysis of variance revealed no statistically significant differences between groups (workshop participants vs non-participants) or across time (before vs after the workshop).

Nutrient Content

ALMOST ALL OF THE MENU SETS PROVIDED ADEQUATE AMOUNTS OF PROTEIN, VITAMIN A, AND VITAMIN C, BUT THERE WERE FREQUENT SHORTFALLS FOR FOOD ENERGY AND IRON.

PERCENTAGE OF MENU SETS PROVIDING NUTRIENTS AT SPECIFIED LEVELS OF RECOMMENDED DIETARY ALLOWANCE (RDA)

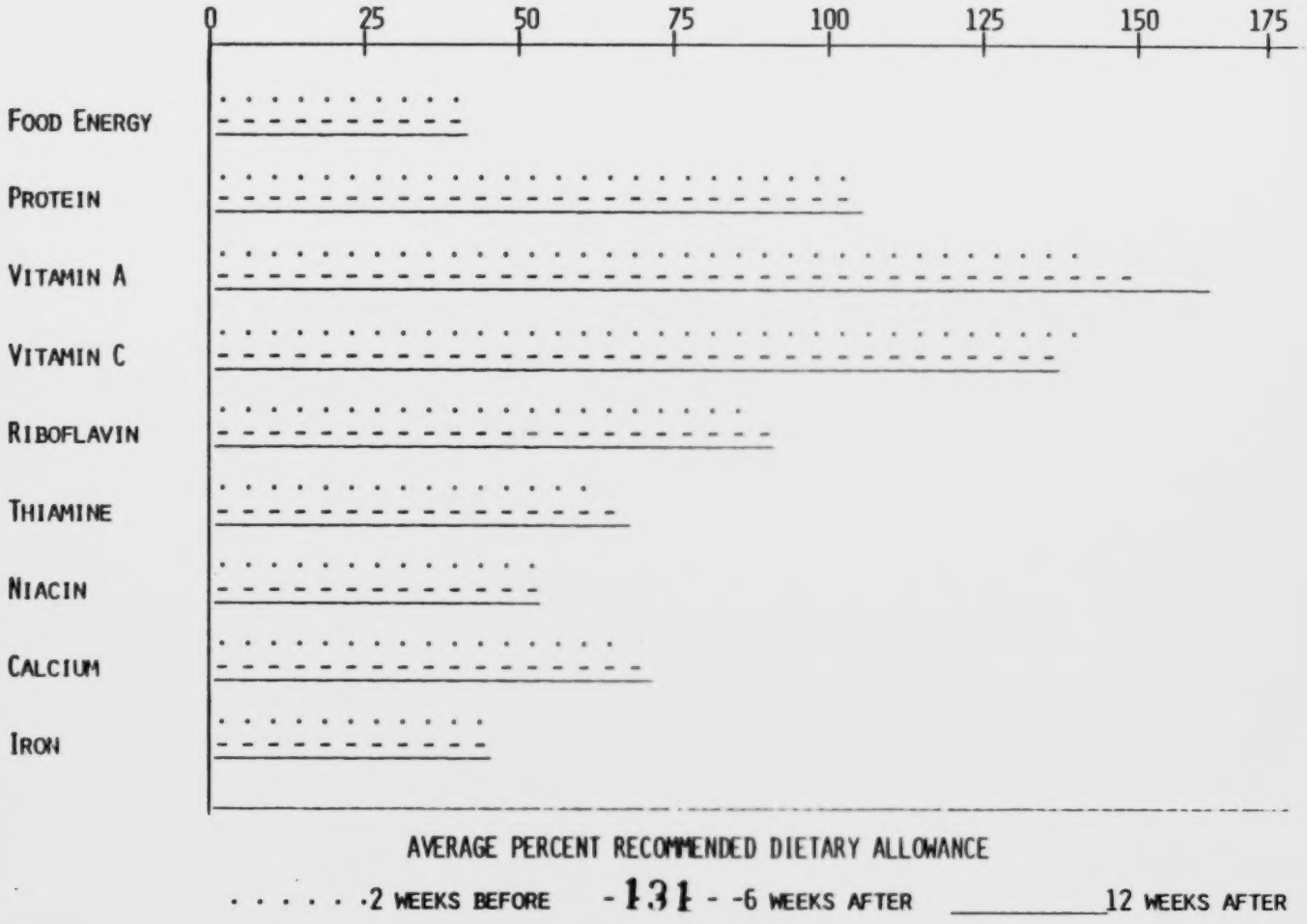
Food energy, fiber, and nutrients	Percent of RDA			
	Below 33	33-49	50-66	67 and over
Food energy	10	63	27	0
Protein	0	0	5	95
Vitamin A	0	2	1	97
Vitamin C	1	1	5	93
Riboflavin	1	7	23	69
Thiamine	4	22	39	35
Niacin	3	31	57	9
Calcium	7	21	22	50
Iron	4	61	27	8

BECAUSE THESE MENUS ARE FOR BREAKFAST (OR AM SNACK), LUNCH, AND PM SNACK, THEY ARE REQUIRED TO SUPPLY 50 PERCENT AND SHOULD SUPPLY 67 PERCENT RDA.

NUTRIENT CONTENT

Almost all of the menu sets provided adequate amounts of protein, vitamin A, and vitamin C, but there were frequent shortfalls for food energy and iron. More than 90 percent of the menu sets fell into the "ideal" category for protein, vitamin A, and vitamin C. The majority (i.e. more than 50 percent) of the menu sets evidenced need for improvement in amount of food energy and iron supplied. Substantial numbers (i.e. more than 25 percent) also showed shortfalls for thiamine, niacin, and calcium.

THE PATTERN OF NUTRIENTS SUPPLIED WAS THE SAME BEFORE AND AFTER WORKSHOP PARTICIPATION.



The pattern of nutrients supplied was the same before and after workshop participation. Inspecting just those data for the group of centers that participated in the workshop showed that the percentage of RDA was virtually identical for times before and after the workshop on almost all dimensions of nutrient content.

Vitamin A was the only nutrient for which there was apparent variation. Within the workshop group, average percent RDA for this nutrient increased from 134 to 150 and then to 163. This increase does not, however, appear to be strongly linked to the workshop curriculum. In the group of centers that did not participate in the workshops, there was a similar increase from the time before to time after the workshop. The average percentage of RDA rose from 133 to 145, but then fell back to 131. Except for the fact that it is the only one of the nutrients that showed any variation across time, the change in percentage of RDA for vitamin A is not very interesting because, even were it systematic, it is in the range of values that is well beyond criterion for an ideal supply of the nutrient.

NUTRIENT CONTENT OF MENUS PLANNED IN CENTERS THAT HAD PARTICIPATED IN THE MENU PLANNING AND KITCHEN ECONOMY WORKSHOP WAS THE SAME AS IN CENTERS THAT HAD NOT.

AVERAGE PERCENTAGE OF RECOMMENDED DIETARY ALLOWANCE (RDA)

NUTRITIONAL ELEMENT	WORKSHOP PARTICIPANTS	NONPARTICIPANTS
FOOD ENERGY	43	45
PROTEIN	105	107
VITAMIN A	149	136
VITAMIN C	136	140
RIBOFLAVIN	87	89
THIAMINE	61	60
NIACIN	51	54
CALCIUM	66	66
IRON	47	46

BECAUSE THESE MENUS ARE FOR BREAKFAST (OR AM SNACK), LUNCH, AND PM SNACK, THEY ARE REQUIRED TO SUPPLY 50 PERCENT AND SHOULD SUPPLY 67 PERCENT RDA.

Nutrient content of menus planned in centers that had participated in the Menu Planning and Kitchen Economy workshop was the same as in centers that had not. When the average percentage of RDA was compared between groups of centers, identical patterns emerged. Menu strengths were in providing adequate supplies of protein, vitamin A, and vitamin C. Weaknesses were in supplying adequate amounts of food energy and iron. Not only was the pattern of strengths and weaknesses the same, but the average percentage of RDA supplied was almost identical element by element.

SENSORY APPEAL

COLORFUL MEALS WAS A STRENGTH AND LIMITED VARIETY OF FRUIT WAS A WEAKNESS IN MOST OF THE MENU SETS, IRRESPECTIVE OF WORKSHOP PARTICIPATION.

PERCENTAGE OF MENU SETS WITH ACCEPTABLE LEVELS OF SENSORY APPEAL

SENSORY ATTRIBUTES	WORKSHOP PARTICIPANTS	NONPARTICIPANTS
VARIETY OF FOODS:		
MEAT/MEAT ALTERNATES	72	67
FRUIT	23	28
VEGETABLES	73	65
BREADS/CEREALS	55	55
**DAIRY	45	45
EXTRA FOODS	38	67
VARIETY OF SENSATIONS:		
FLAVORS	30	40
COLORS	87	85
TEXTURES	32	35
TEMPERATURE	75	67
OVERALL	72	75

** ACCEPTABLE = UTILITY SCORE GREATER THAN 50
UTILITY WAS SCALED BACKWARDS FOR THIS ATTRIBUTE SO THAT MENUS WITH FEWER FOODS FROM THE "EXTRA" GROUP RECEIVED HIGHER SCORES.

SENSORY APPEAL

Colorful meals was a strength and limited variety of fruit was a weakness in most of the menu sets, irrespective of workshop participation. More than 80 percent of the menu sets earned utility scores above 50 for use of color. On the average, foods of 3 or 4 different colors were used in each lunch menu. In addition to being colorful, most of the lunch menus presented foods at a variety of serving temperatures. Often, however, these meals presented too little variety in texture, and substantial numbers of the menus (i.e. 30-40 percent) described meals whose flavors would be seriously out of balance. On the average, only 2 out of every 3 lunches were found to have harmony of flavors. The burritos, spinach, and carrots on one of the lunch menus, for example, would not be an appealing meal for most 3 to 5 year old children. Nor would the lunch of liver, mashed potatoes, spinach and eggs described on another menu be likely to encourage children to practice good eating habits.

Approximately 70 percent of the menus had acceptable levels of variety in the meat/meat alternates group and in the vegetables group. During the week, an average of 4 different meats and 6 or 7 different vegetables were used. Approximately half of the menu sets successfully avoided over use of foods from the "extra foods" group and showed acceptable variety in the breads/cereals group and the dairy group. Most of the menu sets earned much lower scores for variety of fruit. Less than 30 percent earned utility scores that were above the midpoint on the scale for this attribute of sensory appeal. On the average, 4 different fruits were used during a week. There were several centers that used only 1 fruit during an entire week: one center, for example, served apples or apple juice all week and another served peaches on two days but served no other fruit that week.

This pattern of strengths and weaknesses on attributes of sensory appeal was the same for times before and after the workshop and between groups of centers that had and had not participated in the workshop.

DISCUSSION

THE WORKSHOP CURRICULUM HAD NO EFFECT ON MENUS ACTUALLY USED IN THE DAY CARE CENTERS.

* NEEDS FOR IMPROVEMENT IN THE MENUS WERE THE SAME, IRRESPECTIVE OF WORKSHOP PARTICIPATION:
  - FOOD ENERGY AND IRON NEED TO BE INCREASED,
  - MORE VARIETY NEEDS TO BE OFFERED FROM THE FRUIT GROUP, AND
  - THE HARMONY OF FLAVORS PRESENTED OFTEN NEEDS TO BE IMPROVED.

* THE WORKSHOP CURRICULUM SHOULD HAVE HELPED CORRECT THE PROBLEMS:
  - THE CURRICULUM STRESSES TECHNIQUES FOR PROVIDING ADEQUATE SUPPLIES OF IRON AND EMPHASIZES THE IMPORTANCE OF TASTE; AND
  - PRIOR RESEARCH SHOWED THAT THE CURRICULUM PERFORMS WELL IN SHAPING PARTICIPANT'S KNOWLEDGE AND ATTITUDES ABOUT EFFECTIVE MENU PLANNING.

DISCUSSION

The workshop curriculum had no effect on menus actually used in the day care centers. Neither nutrient content nor sensory appeal of menus changed after centers had participated in the **Menu Planning and Kitchen Economy** workshop. The pattern of nutrients supplied and characteristics of sensory appeal of the menus both before and after the workshop were essentially identical to the pattern found in menus prepared in centers that did not participate in the workshops.

This lack of effect cannot be attributed to the absence of need for improvement in day care center menus. On the contrary, results of both the nutrient and the sensory appeal analyses showed that there are a number of areas in which menus need to be improved. Menus were found to need changing in order to provide adequate amounts of food energy and iron. Also, a substantial number of the menus need to be changed to increase variety of fruit offered and to improve the harmony of flavors presented so that children would be encouraged to eat the meals prepared for them. It cannot be concluded, therefore, that there was no improvement because there was no room for improvement.

Nor can it be concluded that the curriculum had no effect because it does not address actual problem areas in menu planning. The curriculum stresses techniques for providing adequate supplies of "leader nutrients" which include protein, vitamin A, vitamin C, thiamine, riboflavin, niacin, and calcium, and iron. The curriculum also emphasizes the importance of taste and visual appeal as key factors in helping children to practice good eating habits.

A prior study demonstrated that the curriculum of the **Menu Planning and Kitchen Economy** workshop performs well in shaping participants' knowledge and attitudes toward effective menu planning. According to the logic of the KABINS model of nutrition education, the workshop should have had a facilitating effect on menu planning behavior. The KABINS model recommended by USDA as a model for planning and evaluating nutrition education programs states that "changes in knowledge (K) lead to changes in attitudes (A) that result in altered behaviors (B) and ultimately result in improved nutritional status (INS)." The fact that the workshop curriculum facilitated changes in knowledge and attitudes but did not have the desired effect on day care center menus suggests that menu planning behavior is strongly influenced by factors other than knowledge and attitudes.

THERE ARE SEVERAL POSSIBLE REASONS WHY THE WORKSHOP CURRICULUM FAILED TO FACILITATE MENU PLANNING BEHAVIOR.

* THE PRINCIPLES OF EFFECTIVE MENU PLANNING MAY BE EASIER TO KNOW THAN TO APPLY.

* THE PEOPLE WHO ATTEND THE WORKSHOPS MAY NOT BE THE ONES WHO ACTUALLY PLAN MENUS IN THE DAY CARE CENTER.

* OTHER FACTORS, SUCH AS FOOD AVAILABILITY OR EXTERNALLY MONITORED STANDARDS, MAY HAVE MORE DEFINITIVE EFFECTS ON MENU PLANNING.

There are several possible reasons why the workshop curriculum failed to facilitate menu planning behavior. It may be that the principles of effective menu planning are easier to know than to apply. There is no simple formula for menu planning. Food combinations must be selected to achieve a balance of nutrients and sensory appeal. Changing one food item (e.g., substituting corn for green beans) in a well-balanced meal may create imbalances in both nutrient content and sensory appeal. Thus, it is possible that even when the principles of effective menu planning are mastered, they are still quite difficult to apply. Finding it difficult, the menu planner may fall back on old habits in preparing day care center menus.

Another possibility for explaining the curriculum's lack of success in improving menus is that the people who participated in the workshops may not be the ones who actually plan the day care center menus. Less than half (48 percent) of the individuals who participated in the 24 **Menu Planning and Kitchen Economy** workshops conducted between January and July 1985 declared themselves to be food service personnel. Even if attendance at these workshops had been 100 percent food service personnel, it is not clear that they would definitely be the ones who planned the menus. It is possible that the menus are planned by the day care center director or by a parent advisory board. The workshop can only be effective in shaping better menus if it is attended by the people who actually plan the menus.

Finally, it is possible that factors such as food availability or externally monitored standards have more definitive effects on menu planning than does staff training. The fact that all the menus showed strength in providing adequate amounts of vitamin A and vitamin C may be evidence of the strong influence of DHS day care center licensing standards. Providing one serving of vegetables and fruits rich in vitamin C each day and one serving rich in vitamin A every other day are requirements for meeting minimum standards. It is possible that day care center menus are assembled by drawing the required number of servings from the food groups shown in the appendix of the minimum standards handbook without careful consideration of how the foods combine to produce meals and snacks that would meet nutritional needs and be appealing to the children. The minimum standards are a valuable resource for assuring that child care personnel make every effort to provide children with food that is nutritious and served in variety and amounts adequate to ensure growth and development. The guidelines are not, however, a substitute for thoughtful menu planning.

IN ADDITION TO IMPROVED STAFF TRAINING, OTHER RESOURCES AND SERVICES MAY BE NEEDED TO HELP DAY CARE CENTERS PLAN MENUS THAT ENCOURAGE CHILDREN TO PRACTICE GOOD EATING HABITS.

* ALTERNATIVES FOR AUGMENTING WORKSHOP EFFECTS INCLUDE:

  - FOCUSING THE WORKSHOP CURRICULUM ON THOSE SPECIFIC DIMENSIONS WHERE IMPROVEMENT IS NEEDED,
  - ADVISING DAY CARE CENTER DIRECTORS OF THE IMPORTANCE OF ENCOURAGING THEIR FOOD SERVICE STAFF TO PARTICIPATE IN THE WORKSHOPS AND TO PRACTICE WHAT THEY LEARN,
  - MAKING PREPLANNED CYCLE MENUS AND STANDARDIZED RECIPES AVAILABLE TO THE DAY CARE CENTERS, AND
  - CONDUCTING STUDIES TO DETERMINE WHAT FACTORS OTHER STAFF KNOWLEDGE AND ATTITUDES HAVE DEFINITIVE EFFECTS ON MENU PLANNING.

In addition to improved training, other resources and services may be needed to help day care centers plan menus that encourage children to practice good eating habits. The training itself can be improved in at least two ways. First, the workshop can be focused more sharply on those specific dimensions of nutrient content and sensory appeal where improvement is needed. Second, day care center directors can be advised of the importance of encouraging their food service staff to participate in the workshops and actually to practice what they learn. Chances then are improved that the persons who participate in the workshops are the ones who plan day care center menus.

Resources and services in addition to improved training may be needed to help day care centers plan menus that encourage children to practice good eating habits. Possibilities for augmenting the effects of the menu planning workshop include providing day care centers with preplanned cycle menus and standardized recipes. If preplanned menus and recipes that comply with minimum standards for licensing and assure the appropriate balance of nutrients and sensory appeal were readily available, it would be easier for workshop participants to apply what they learn in the workshop.

Ultimately, the impact that the NET program will have on menus in day care centers may depend on results of studies showing what factors other than staff knowledge and attitudes have definitive effects of menu planning. Two of the studies planned for the NET program evaluation during 1986-87 will provide some information in this area. One study will provide information about menu planning behavior in registered family homes. In another study, staff training needs in day care centers will be surveyed. This study will provide information about who actually plans day care center menus. By capitalizing on these studies and keeping current with research conducted elsewhere, the workshop curriculum and other NET program activities can be shaped to help day care centers plan better menus.

APPENDIX D

EVALUATION REPORT

Reasons for Nonparticipation in Nutrition Education and Training (NET) Program Workshops during 1984

REACHING MORE PEOPLE WITH MORE INFORMATION ABOUT NET WORKSHOPS CAN HELP INCREASE PARTICIPATION IN THE WORKSHOPS.

	PERCENT OF TRAINERS INDICATING THIS PROBLEM IS AN IMPORTANT AND FREQUENT BARRIER TO WORKSHOP PARTICIPATION
DON'T KNOW WORKSHOPS ARE AVAILABLE	84
DON'T KNOW WORKSHOPS ARE FREE	80
DON'T KNOW ABOUT WORKSHOP SCHEDULING	95
DON'T KNOW HOW TO PREREGISTER	80
DON'T BELIEVE NUTRITION EDUCATION CAN REDUCE FOOD WASTE OR IMPROVE WELL-BEING	72
ADMINISTRATORS DON'T MAKE TIME AVAILABLE	80
SCHOOL OFFICIALS DON'T ADVOCATE PARTICIPATION	72

EXECUTIVE SUMMARY

Reaching more people with more information about Nutrition Education and Training (NET) Program workshops can help increase participation in the workshops. The workshops are a major activity of the federally funded Texas NET Program. By providing educators and food service personnel with information about the fundamentals of nutrition, nutrition education, and food service management the workshops help achieve the federally stipulated goal of reaching all children in the state with opportunities to learn and to practice good eating habits.

During 1984, approximately one half of the nonprofit child care centers and private schools that were eligible to participate took advantage of the opportunity to participate in the workshops. Because participation is a factor that has great influence on the effectiveness of the workshops as a means for reaching the children, NET staff are seeking even larger participation. This study was conducted to develop information to aid in making decisions about how to increase workshop participation.

Twenty NET workshop trainers were consulted for their expert opinions about reasons why people might choose not to participate in the workshops. The trainers completed a questionnaire that contained 18 statements describing factors that could act as barriers to workshop participation. Their responses to the questionnaire items were inspected for evidence of concensus about which ones of the potential barriers are actual reasons for nonparticipation.

Lack of information was identified as the major reason for nonparticipation in NET workshops. Trainers indicated that potential participants don't know the workshops are available, don't know that the workshops are free, don't know when or where workshops can be scheduled, and don't know how to preregister. The data also suggested that potential participants don't perceive the need for the workshops--i.e. they don't believe that nutrition education can reduce food waste and improve children's well-being and their local school administrators don't encourage them to participate by making time available or advocating participation.

During 1985, steps were taken to encourage larger participation in NET workshops. Arrangements were made to allow centers to schedule workshops at their own convenience. Guided by results of this study, the workshop coordinator wrote to the director of each eligible child care center and to the school food service authority of eligible private schools. The letter included a synopsis of each workshop, a statement that the workshops are free, written guidelines and an application form for scheduling workshops, and a message about the need for nutrition education and about how important it is for day care directors and sponsors to encourage their staff to participate in the workshops.

BACKGROUND

WORKSHOP PARTICIPATION IS A FACTOR THAT HAS GREAT INFLUENCE ON THE EFFECTIVENESS OF THE TEXAS NFT PROGRAM.

EDUCATORS AND FOOD SERVICE PERSONNEL IN NON-PROFIT CHILD CARE CENTERS AND SCHOOLS ARE INVITED TO PARTICIPATE IN NFT WORKSHOPS.

WORKSHOP PARTICIPATION PROVIDES INFORMATION AND EXPERIENCE IN THE FUNDAMENTALS OF NUTRITION, NUTRITION EDUCATION, AND FOOD SERVICE MANAGEMENT.

INFORMED EDUCATORS AND FOOD SERVICE STAFF PROVIDE APPROPRIATE OPPORTUNITIES FOR CHILDREN TO LEARN AND PRACTICE GOOD EATING HABITS.

BACKGROUND

Workshop participation is a factor that has great influence on the effectiveness of the Texas Nutrition Education and Training (NET) Program. The goal of this federally funded Child Nutrition Program is to assure that children have opportunities to learn and to practice good eating habits. One way in which this goal is approached is through the provision of workshops for educators and food service personnel in child care centers and schools. By providing training and information on topics in the fundamentals of nutrition, nutrition education, and food service management, the workshops encourage participants to provide appropriate opportunities for the children.

Seven different workshops are offered. Two of them are designed for educators in child care centers and schools, four of them cover topics in food service management, and one is designed for day home sponsors and operators. The workshops are conducted in the participants' own communities by registered and licensed dietitians who live in the community. Workshops are scheduled for half-day or full-day sessions. They are free of charge. All participants receive copies of selected nutrition education or food service materials as an incentive for their participation.

During 1984 more than 2,000 non-profit child care centers were invited to participate in NET workshops. Approximately 100 workshops were conducted. Individuals from approximately 800 child care centers and schools participated. That means that nearly one-half of the target population took advantage of the opportunity to participate in NET workshops. It also means, however, that a substantial portion of the target population did not participate.

This study was conducted to identify reasons for nonparticipation in NET workshops. Information about reasons for nonparticipation was needed to aid in making decisions about how to secure the largest possible participation in NET workshops. By increasing the number of workshop participants, the NET progam increases its ability to achieve the federally stipulated goal of reaching all children in the state with opportunities to learn about and practice good eating habits.

PROCEDURES

WORKSHOP TRAINERS WERE CONSULTED FOR THEIR EXPERT OPINIONS ABOUT FACTORS THAT ACT AS BARRIERS TO WORKSHOP PARTICIPATION AND ABOUT THE FREQUENCY WITH WHICH THESE BARRIERS OCCUR IN THE POPULATION OF POTENTIAL WORKSHOP PARTICIPANTS.

SECTION I

In this section, please think how one person could be influenced to participate or not to participate in NET workshops. Think of Ms. X as a potential workshop participant. Read the list of statements and rate the importance of each one as a reason that might influence Ms. X's decision not to request or attend a NET workshop. In this section don't worry about whether the statements are true. Rate their importance based on the assumption that they are true.

CIRCLE the appropriate number beside each statement using this four-point scale:

1	2	3	4
Not Applicable	Not Important	Somewhat Important	Very Important

01) She isn't aware that workshops are available.....1 2 3 4

02) She doesn't know that the workshops are free.....1 2 3 4

03) She doesn't know when or where workshops can be scheduled.....1 2 3 4

04) She doesn't know how to pre-register.....1 2 3 4

05) She doesn't feel confident that she can speak and read English at the level of the workshop.....1 2 3 4

06) She thinks she already knows enough about food and health, nutrition education, and food service management.....1 2 3 4

07) She doesn't think that nutrition education can help reduce food waste or improve the well-being of children.....1 2 3 4

08) She doesn't think the workshop will help to improve her performance on the job.....1 2 3

09) She doesn't think the workshop will help to improve her own health.....1 2 3

10) She doesn't think the workshop will be fun.....1 2 3

11) She doesn't think she needs any of the materials that are distributed at the workshops.....1 2 3

12) Time has not been made available for her to attend the workshop during working hours and/or no arrangements have been made to compensate her for the hours she would put into the workshop outside of working hours...1 2 3

13) Transportation to and from the workshop is a problem...1 2 3

14) Child care for her own children is not readily available during the hours of the workshop.....1 2 3

15) Licensing and credentialling representatives have not endorsed or advocated participation in the workshops...1 2 3

16) Local school officials have not endorsed or advocated participation in the workshops.....1 2 3

17) Parent advisory groups have not endorsed or advocated participation in the workshops.....1 2 3

18) The supervisory agency does not consider workshop participation as a factor in licensing, credentialling, or job promotion decisions that affect her.....1 2 3

PROCEDURES

Workshop trainers were consulted for their expert opinions about factors that act as barriers to workshop participation and about the frequency with which these barriers occur in the population of potential workshop participants. A workshop participation questionnaire was administered at the trainers' 1985 orientation meeting in December 1984. Completed questionnaires were returned by 19 of the 20 trainers.

The questionnaire contained 18 statements describing factors that might act as barriers to workshop participation. The list of potential barriers was developed using a conceptual model of acceptance and use of innovations. In this case, use of the innovation means participation in NET workshops. According to the model, there are four things that people need in order to participate in the workshops: they need to **know how** to participate, have positive **attitudes** about participating, have access to **resources** that enable their participation, and perceive that workshop participation is compatible with **policies** governing activities in their work place and community. Problems occurring on any of these four dimensions can act as barriers to workshop participation.

The items on the questionnaire describe one or more problems that can occur on each of the four dimensions that the model identifies as prerequisites to workshop participation. The trainers were asked for two opinions about each of the 18 potential problems. First, they were asked to rate the importance of each as a reason for nonparticipation. Second, the trainers were asked to estimate the frequency of occurrence of these barriers--that is, they were asked to estimate the number of potential workshop participants with these reasons for nonparticipation.

TWO DATA ANALYSIS PROCEDURES WERE APPLIED TO IDENTIFY FACTORS THAT ARE IMPORTANT AND FREQUENTLY OCCURRING BARRIERS TO WORKSHOP PARTICIPATION.

* AVERAGE IMPORTANCE RATINGS AND AVERAGE OCCURRENCE ESTIMATES WERE CALCULATED AND PAIRED TO IDENTIFY FACTORS THAT WERE BOTH IMPORTANT AND FREQUENT.

* IMPORTANCE RATINGS AND OCCURRENCE RATINGS WERE CROSSTABULATED TO IDENTIFY FACTORS REPORTED BY THE MAJORITY OF TRAINERS TO BE BOTH IMPORTANT AND FREQUENT.

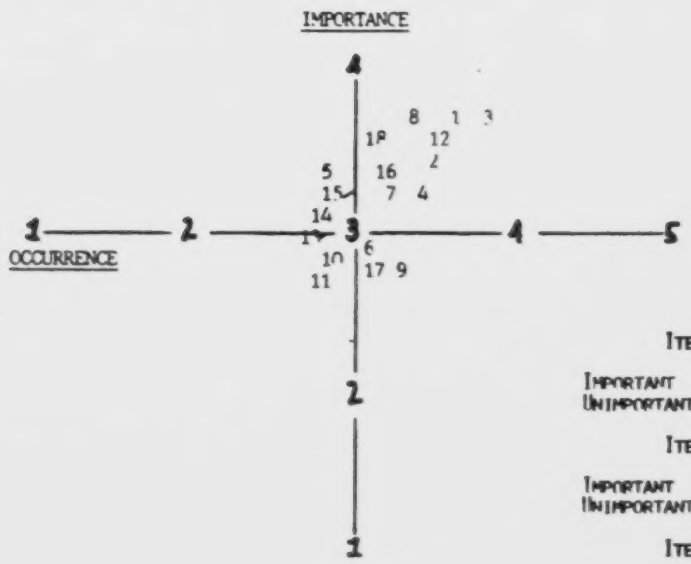
Two data analysis procedures were applied to identify factors that are important and frequently occurring barriers to workshop participation. In the first procedure, the average importance rating and the average occurrence estimate were computed for each of the 18 potential barriers to workshop participation. The pair of averages for each item was evaluted to identify those items for which both averages were greater than 3. A value of 3 on the importance scale means that the problem is at least somewhat important, and a value of 3 on the occurrence scale means that more than 25 percent of the target population encounter the problem. Consequently, this procedure identified problems which are both important and frequent.

In the second data analysis procedure, the importance rating and occurrence estimate made by each of the workshop trainers were recoded and crosstabulated. Importance ratings of 3 or 4 were recoded "important" and ratings of 1 or 2 were coded "unimportant." Occurrence values of 3, 4, or 5 were coded "frequent" and values of 1 or 2 were coded "infrequent." The pair of recoded scores was used to assign the trainer's response to one of four cells in a matrix crossing importance with occurrence. These crosstabulations were evaluated to identify those items for which the majority (i.e., at least 67 percent) of the trainers had reported the problem to be both important and frequent.

RESULTS

LACK OF INFORMATION WAS IDENTIFIED AS THE MAJOR REASON FOR NONPARTICIPATION IN NET WORKSHOPS.

AVERAGE SCALE VALUES



NUMBER OF TRAINERS REPORTING THAT THE ITEM DESCRIBES AN IMPORTANT AND FREQUENT PROBLEM

	Frequent	Infrequent
Item 1		
Important	16	?
Unimportant	0	1
Item 2		
Important	15	?
Unimportant	1	1
Item 3		
Important	13	0
Unimportant	0	1
Item 4		
Important	15	1
Unimportant	?	1
Item 5		
Important	11	7
Unimportant	1	0
Item 6		
Important	11	3
Unimportant	3	2
Item 7		
Important	13	2
Unimportant	2	?
Item 8		
Important	11	2
Unimportant	5	1
Item 9		
Important	9	1
Unimportant	5	4
Item 10		
Important	10	4
Unimportant	2	3
Item 11		
Important	7	3
Unimportant	3	6
Item 12		
Important	15	1
Unimportant	0	3
Item 13		
Important	8	6
Unimportant	1	2
Item 14		
Important	11	4
Unimportant	0	4
Item 15		
Important	11	4
Unimportant	1	?
Item 16		
Important	13	3
Unimportant	0	?
Item 17		
Important	10	1
Unimportant	2	6
Item 18		
Important	11	5
Unimportant	0	1

RESULTS

Lack of information was identified as the major reason for nonparticipation in NET workshops. There was consensus among the trainers that potential participants don't know the workshops are available (item 1), don't know the workshops are free (item 2), don't know when or where workshops can be scheduled (item 3), and don't know how to preregister for the workshops (item 4).

Trainers also were in agreement that potential participants don't think that the workshops are needed (item 7) and are not encouraged to participate by their local school officials--they are not compensated for time they would spend in the workshops (item 12) and local school officials do not endorse or advocate participation in the workshops (item 16).

The response to item 7 was unexpected. It indicates that the majority of trainers feel that a substantial segment of the target population does not accept the premise upon which NET is based--that nutrition education can reduce food waste and improve the well-being of children.

These seven items (items 1, 2, 3, 4, 7, 12, and 16) were items identified as important and frequent problems by both of the data analysis procedures. It was concluded, therefore, that they describe actual reasons for nonparticipation in NET workshops.

DISCUSSION

THESE RESULTS SUGGEST THAT LARGER PARTICIPATION IN NET WORKSHOPS CAN BE ENCOURAGED BY PROVIDING MORE INFORMATION TO POTENTIAL PARTICIPANTS AND TO ADMINISTRATORS OF DAY CARE CENTERS AND SCHOOLS.

* TRAINERS REPORTED THAT POTENTIAL PARTICIPANTS DON'T KNOW ABOUT THE WORKSHOPS AND ARE NOT ENCOURAGED TO PARTICIPATE BY THEIR LOCAL SCHOOL OFFICIALS.

* CHANGES IN PROCEDURES FOR PROVIDING INFORMATION ABOUT THE WORKSHOPS CAN HELP SURMOUNT THESE BARRIERS.

DISCUSSSION

These results suggest that larger participation in NET workhshops can be encouraged by providing more information to potential participants and to administrators of day care centers and schools. The potential participants are perceived to have generally positive attitudes about participating in the workshops and they have access to most of the resources they need to enable their participation. But they don't know how to participate in the workshops and they are not encouraged to participate by their local school officials. These barriers to workshop participation can be overcome by providing more information about the workshops and about the benefits that school and center administrators can expect when their staff participate in the workshops.

Because this study showed that substantial numbers of potential participants may not be convinced that nutrition education can help reduce food waste or improve the well-being of children, it is especially important that information be made available about the effectiveness of nutrition education and sound food service management. Such information would reinforce positive attitudes of potential participants and would help to persuade center and school administrators that they should help their staff participate in the workshops.

DURING 1985, STEPS WERE TAKEN TO ENCOURAGE LARGER PARTICIPATION IN NET WORKSHOPS.

* ARRANGEMENTS WERE MADE TO ALLOW CENTERS TO SCHEDULE WORKSHOPS AT THEIR OWN CONVENIENCE.

* THE LETTER OF INVITATION SENT TO DAY CARE CENTER DIRECTORS INCLUDED INFORMATION ABOUT THE WORKSHOPS AND ABOUT THE BENEFITS THAT CAN BE EXPECTED WHEN STAFF PARTICIPATE.

During 1985, steps were taken to encourage larger participation in NET workshops. Arrangements were made to allow day care centers to schedule workshops according to their own needs. A letter sent to the director of each of the eligible day care centers and to the school food service authority at private schools invited them to specify which ones of the workshops they wished to schedule for their staff and to specify preferred dates for training. This procedure was a major change from scheduling arrangements in prior years. Until 1985, eligible centers were invited to attend workshops conducted on a prearranged schedule. To facilitate workshop scheduling under the new procedure, workshop trainers were encouraged to be active in working with the center directors to select and schedule workshops to meet their training needs.

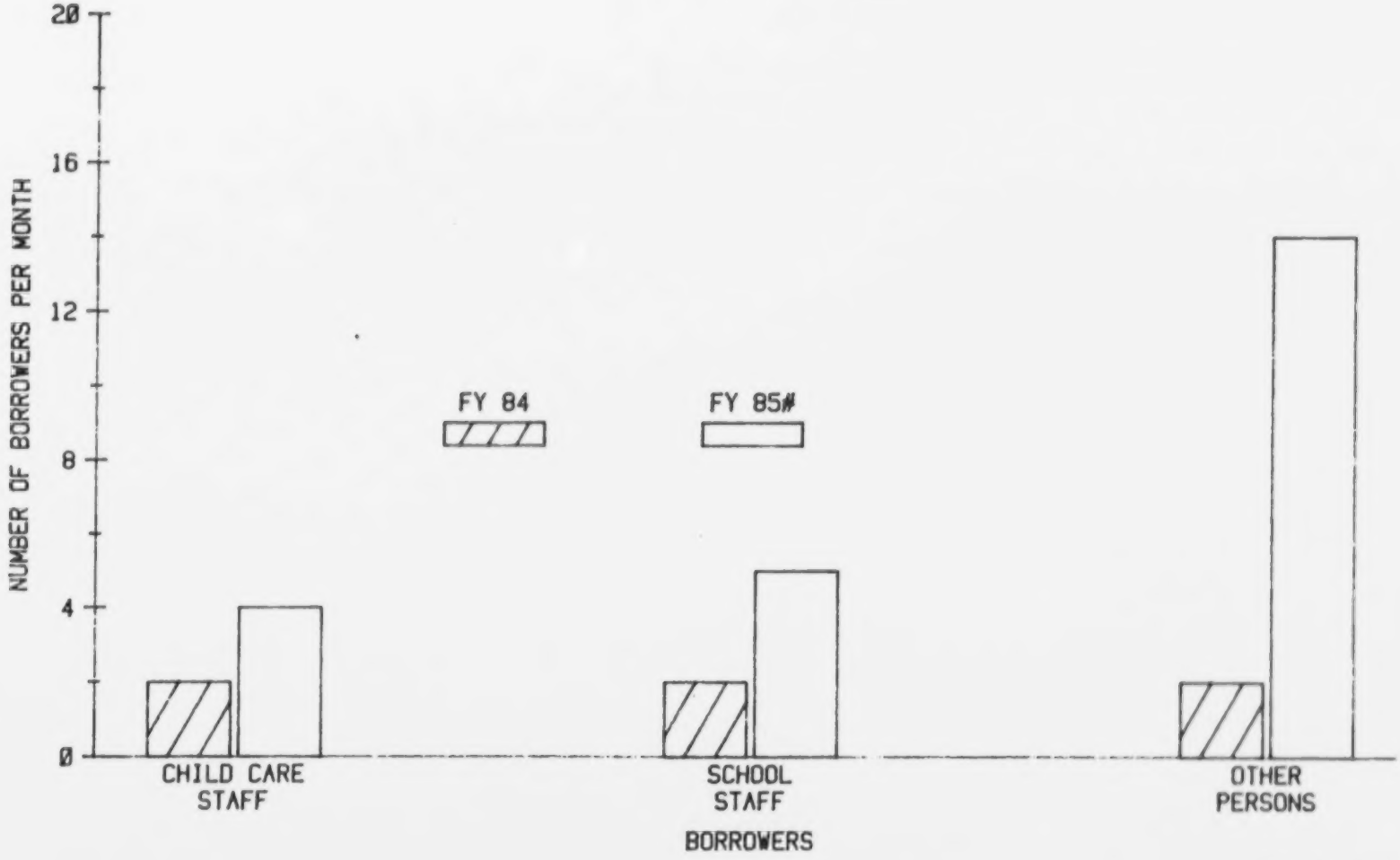
Guided by results of this study, the workshop coordinator urged day care directors and sponsors to encourage their staff to participate in the workshops. The letter of invitation included a synopsis of each of the workshops describing its purpose and appropriate target group. The letter indicated that the workshops are free and this information was repeated on the synopsis sheets. The letter also included a message about the need for nutrition education. It was written to inform day care center directors about the nutrition related health problems to which preschool aged children are susceptible and to show how the workshops can help reduce the risk of these health problems. The letter provided information about the workshops and about the benefits that day care center directors and school administrators can expect when their staff participate in NET workshops. These appeals should increase participation in NET workshops and thereby help to increase the effectiveness of the Texas NET Program.

APPENDIX E

EVALUATION REPORT

USE OF THE NUTRITION EDUCATION AND TRAINING (NET) LENDING LIBRARY COLLECTION OCTOBER 1983 THROUGH JUNE 1985

USE OF THE NET LENDING LIBRARY COLLECTION HAS INCREASED DRAMATICALLY, BUT EFFORTS STILL ARE NEEDED TO ENCOURAGE USE BY STAFF OF SCHOOLS AND CHILD CARE CENTERS.



#THROUGH JUNE

EXECUTIVE SUMMARY

The Nutrition Education and Training (NET) Program is a federally funded program to provide children with opportunities to learn about and practice good eating habits. One of the major components of the Texas NET Program is a lending library collection organized in 1982 to make nutrition learning resources available to anyone desiring to know more about nutrition. Educators and food service personnel in child care centers and schools are key targets for the library services. During 1984 and 1985, special efforts were made to publicize the availability of the NET lending library collection. This study examines how patterns of library use were affected by the publicity.

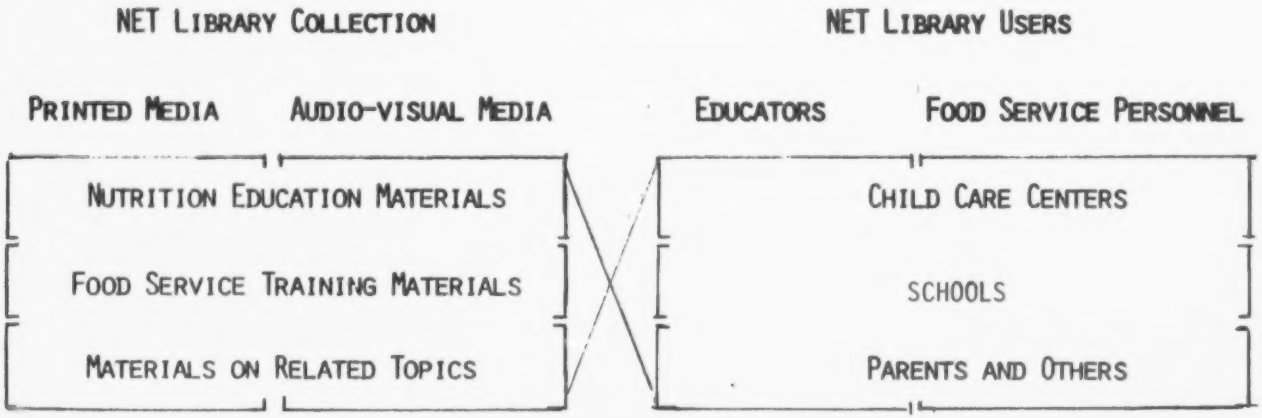
Date due slips and feedback forms circulated with items borrowed from the collection provided data on use of the library from October 1983 through June 1985. Different methods were applied to analyze the effects of different efforts to publicize. Effects of publicity in a journal article were analyzed in before-after-control group comparisons. Effects of NET workshop curricula were determined by cross-tabulating incidence of library use and workshop participation. Effects of the NET Program media catalog were verified in time-series analyses.

Use of the NET library collection increased dramatically during fiscal year 1985. Most of the gains can be attributed to publication of the media catalog. An increase in borrowing of selected library items was observed after publicity in a journal article, but the gain was not statistically significant. Discussing the library collection during NET workshops had no direct effect on use of the library. Publication of **Volume I: Audio-visual Materials** of the media catalog precipitated changes that exceeded expectations. The number of borrowers, the number of audio-visual materials borrowed, and the number of persons reached per month increased by more than 300 percent after publication of the catalog.

Publicity still is needed to encourage use of the collection by staff of schools and child care centers. Increases in number of borrowers in these groups were relatively modest. Family day home operators and NET workshop participants were found to be virtually untapped markets for the lending library services. They constitute, therefore, prime targets for additional efforts to publicize.

BACKGROUND

THE NET LENDING LIBRARY COLLECTION IS A RESOURCE TO PROMOTE NUTRITION LEARNING.



BACKGROUND

The Nutrition Education and Training (NET) lending library collection is a resource to promote nutrition learning. It is a major component of the Texas NET Program, which is a federally funded activity established in 1977 to teach the fundamentals of nutrition to children, educators, school food service personnel, and parents. The Texas NET Program staff began in 1982 to organize a lending library of materials dealing specifically with nutrition and its relation to health and well-being. The purpose of the collection is to provide resources for anyone desiring to learn more about nutrition. Educators and food service personnel in child care centers and schools are particular target groups for use of the NET lending library collection.

The collection is maintained at the headquarters complex of the Texas Department of Human Services (DHS). It includes materials in three broad topic areas: 1) nutrition education, 2) food service training, and 3) related topics--such as diet therapy, general education, and training. Materials are available in audio-visual and printed media. The audio-visual collection includes films, filmstrips, slides, videotapes, and audio resources. The printed collection includes children's books, curriculum guides, resource guides, training aids (e.g., posters), and other books and pamphlets (e.g., cookbooks, nutrition textbooks, pamphlets published by the United States Department of Agriculture).

Materials are loaned free of charge. Requests to borrow materials are made by writing to the librarian, telephoning the librarian or members of the NET staff, or by visiting the library. The loan period for books is four weeks and extensions can be arranged. Audio-visual materials are loaned for specific show dates. Except for 16 millimeter films, all library items mailed to or from the library are sent using special library rates. These borrowing procedures are designed to make use of the library as convenient as possible for the borrower.

EFFORTS ARE MADE TO PUBLICIZE AVAILABILITY OF THE LIBRARY COLLECTION.

* THE COLLECTION IS MENTIONED IN PROFESSIONAL PUBLICATIONS
* USE OF THE COLLECTION IS DISCUSSED IN NET WORKSHOPS
* THE NET PROGRAM MEDIA CATALOG IS BEING DISTRIBUTED

Efforts are made to publicize the availability of the NET lending library collection. The goal is to achieve high volume use of this nutrition learning resource. Discussion of the collection in professional publications is one procedure that has been used to publicize the library collection. In an article written for the **Texas Child Care Quarterly**, the NET Program Coordinator recommended a set of items that could be borrowed to aid in teaching young children about dental health. The library collection also is included as a topic in talks and displays presented at meetings of the Dietetics Association, the Society for Nutrition Education, and other appropriate groups.

A second way to publicize the library is including it as a topic in the curricula of NET workshops conducted throughout the year. Participants in these workshops most often are educators and food service personnel working in child care centers and schools. The workshop curricula are organized to encourage these individuals to make use of the collection as a resource to support their own nutrition education and food service management programs.

The primary way to notify potential users of the availability of the lending library collection is the publication and distribution of the NET Program media catalog. The catalog has been meticulously compiled to list over 1200 items available for loan. Materials are listed by type, including films, children's books, and resource guides. Alphabetical indices by title and by key ideas are included in the catalog. Each item entry includes a description of the material, a list of target groups for the material, and a content summary. These annotations were developed by registered and licensed dietitians who also evaluated the accuracy and utility of the items.

The catalog is printed at DHS and mailed to child care centers, public and private schools, and other agencies indicating need for the catalog. The first volume, which lists audio-visual materials, became available in December 1984. Approximately 500 catalogs were mailed during December. An additional 9,000 copies of the catalog were printed and mailed between the first of January and the end of May 1985. The second volume lists printed materials. It will be available by the fall of 1985.

THIS STUDY EXAMINES HOW USE OF THE LIBRARY COLLECTION IS AFFECTED BY EFFORTS TO PUBLICIZE.

* DID USE OF SELECTED MATERIALS INCREASE AFTER THEY WERE CITED IN A JOURNAL ARTICLE?

* DO WORKSHOP PARTICIPANTS USE THE COLLECTION?

* DID USE OF THE LIBRARY INCREASE FOLLOWING DISTRIBUTION OF VOLUME I OF THE MEDIA CATALOG?

This study examines how use of the library collection is affected by efforts to publicize. These efforts, especially development and distribution of the media catalog, constitute major investments of time and money. They are expected to yield high returns. In the Texas NET State Plan for fiscal year 1985 (FY 85), NET Program staff projected a 150 percent increase in use of the library. Information about changes in borrowing patterns is needed to monitor progress toward that goal.

Information about borrowing patterns also is needed to aid in making decisions about when, to whom, and by what means the library collection should be publicized to promote its use as a nutrition learning resource. This study provides information about changes in use of the library associated with efforts to publicize it in professional publications, in NET workshop curricula, and through distribution of the NET Program media catalog. Borrowing rates for selected library materials were examined before and after they were cited in an article in the **Texas Child Care Quarterly**. The proportion of workshop participants who are also library users was calculated. And, finally, borrowing patterns before and after publication of volume I of the media catalog were compared.

PROCEDURES

FEEDBACK FORMS CIRCULATED WITH ITEMS BORROWED FROM THE COLLECTION PROVIDED DATA ON USE OF THE LIBRARY.

Title of material: Who Can Be Training By Food Service Training

[redacted] Date: 3 15 85
Social Security Number Mo Day Yr

Please give us feedback about the material you used so we can evaluate the usefulness of the library project and its contents. Select only one answer per question. CIRCLE the number next to the answer you choose. Use question 7 if you need to elaborate on any answer. Thank you for your help!

1. For what type of agency do you work?
   (1) Public School
   2 Private Grade School or High School
   3 Day Care Center
   4 Family Day Home
   5 Hospital
   6 TDHR
   7 Other government agency _____
   8 Library
   9 Other _____

2. What is your function?
   1 Teacher
   (2) Food Service Personnel
   3 Food Program Specialist
   4 Child Development Specialist
   5 Nutritionist
   6 Licensing Representative
   7 Medical Personnel
   8 Other _____

3. How did you use these materials?
   10 As resource material for developing other materials or programs
   (20) For own information
   As part of presentation for:
   31 preschool children
   32 children grades K-3
   33 children grades 4-6
   34 children grades 7-8
   35 children grades 9-12
   36 teachers
   (37) food service workers
   38 parents
   39 other _____
   40 Reviewed materials
   50 Checked out but not reviewed or used
   60 Other _____

4. Approximately how many people used or saw the materials? 1

5. Would you recommend the materials to others?
   (1) Yes 2 No

6. What is your overall rating of the materials?
   1 Poor 2 Fair 3 Good (4) Excellent

Theme of Material:

(10) Food Service Trng
NUTRITION Ed
21 Preschool
22 Elementary
23 Secondary
24 High School
25 Adult
26 Teacher/Provider
27 Pre-Elem School
28 Thru High School
29 All Ages
40 General Nutrition
50 Diet Therapy
60 General Education
70 Training
80 Other

Type of Material:

01 Filmstrip
02 Film
03 Slides
04 Videotape
05 Audio Resource
07 Other book or Pamphlet
(08) Curriculum
09 Resource Guide
10 Teaching Aid
06 Children's Book

Catalog Number:

2079

171

PROCEDURES

Feedback forms circulated with items borrowed from the NET lending library collection provided data on use of the library. The form contains six precoded items asking borrowers about the type of agency for which they work (e.g., public school, hospital), their role at the agency (e.g., educator, nutritionist), how they used the material (e.g., for own information, as part of presentation for teachers), how many people used or saw the material, and their own evaluation of the material. Borrowers also are asked to fill in the title of the borrowed material, the date, and their social security number. They are invited to make additional comments at the bottom of the form.

The borrower returns the form by enclosing it with the borrowed material when it is returned to the library. The librarian forwards the completed form to the NET Systems Coordinator who reviews the user's evaluation of the material and any comments the user may have written on the form. The title of the borrowed material then is located in the catalog so that the form can be coded for theme (e.g., food service training, preschool nutrition education), type (e.g., film, children's book), and catalog entry number.

ALTHOUGH RETURN RATES FOR THE FEEDBACK FORMS CAUSES AN UNDERESTIMATION OF ACTUAL VOLUME OF LIBRARY USE, THE FORMS PROVIDE DATA WITH WHICH TO IDENTIFY NEEDS FOR CONTINUING PUBLICITY.

ESTIMATES OF MONTHLY BORROWING RATES FOR 20 RANDOMLY SELECTED TITLES

MEASURE	BEFORE OCT 83-DEC 84	AFTER JAN 85-JUN 85	OVERALL OCT 83-JUN 85
DATE DUE SLIPS	1.0	3.0	1.6
FEEDBACK FORMS	0.5	1.5	0.8

Although return rates for the feedback forms causes an underestimation of the actual volume of library use, the forms provide data with which to identify needs for continuing publicity. They are the only source of information about who the library users are and what uses they make of the materials they borrow. It has not been possible, however, to ensure absolute uniformity in distribution or return of the feedback forms. Not everyone who borrows materials from the library collection will spend the time necessary to complete the feedback form. It sometimes happens that the feedback from is not included with materials that are loaned from the collection. For these reasons, the number of feedback forms available for coding are fewer than the number of items borrowed from the lending library collection. In November 1984 this problem and this study were discussed with DHS's library director. At that time it was agreed that procedures for circulating and collecting the feedback form would remain unchanged so as to minimize bias introduced by implementing the study.

To determine the degree to which the feedback forms underestimate actual volume of use, date due slips were checked for all copies of 20 randomly selected library titles. Dates shown on these slips were used to calculate the per month borrowing rate for this set of 20 library titles. Data from the library users feedback form was compiled for these same 20 titles and used to estimate the per month borrowing rate. Comparison of these two sets of figures indicated that measures of library use based on data from the library users' feedback forms underestimate actual volume of use by about 50 percent.

If date due slips are used to measure borrowing rate, the monthly average for the set of 20 library items is 1.6 for the period October 1983 through June 1985. If the user feedback forms are used to measure borrowing rate for these same 20 items the monthly average is 0.8. When the time frame is shifted to allow comparison of borrowing rates before and after publication of the NET media catalog, the same relationships are discovered. When date due slips are used to measure borrowing of the 20 items the averages are 1.0 per month before publication of the catalog and 3.0 after the catalog was published. When user feedback forms are used to measure borrowing rates, the averages are 0.5 before and 1.5 after publication of the catalog.

Because the user feedback forms supply information needed to answer some of the evaluation questions, they were used to estimate borrowing rates in two of the three analyses performed as part of this study. When reviewing results obtained from those analyses, it should be remembered that they have generated a very conservative estimate of actual volume of library use.

DIFFERENT METHODS WERE APPLIED TO ANALYZE EFFECTS OF DIFFERENT EFFORTS TO PUBLICIZE.

* EFFECTS OF PUBLICITY IN A JOURNAL ARTICLE WERE ANALYZED IN BEFORE-AFTER-CONTROL GROUP COMPARISONS

* EFFECTS OF NET WORKSHOP CURRICULA WERE DETERMINED BY CROSS-TABULATING LIBRARY USE AND WORKSHOP PARTICIPATION

* EFFECTS OF THE MEDIA CATALOG WERE VERIFIED WITH GOTTMAN'S PROCEDURE FOR TIME-SERIES ANALYSIS

Different methods were applied to analyze effects of different efforts to publicize. Data from date due slips were used to evaluate effects of publicity in a journal article. Data from the coded library feedback forms were prepared for analysis by submitting them to SPSS-X procedures for sorting cases and matching files. Information on the printouts was used to construct measures of library use with which to evaluate effects of the workshop curricula and effect of the NET media catalog.

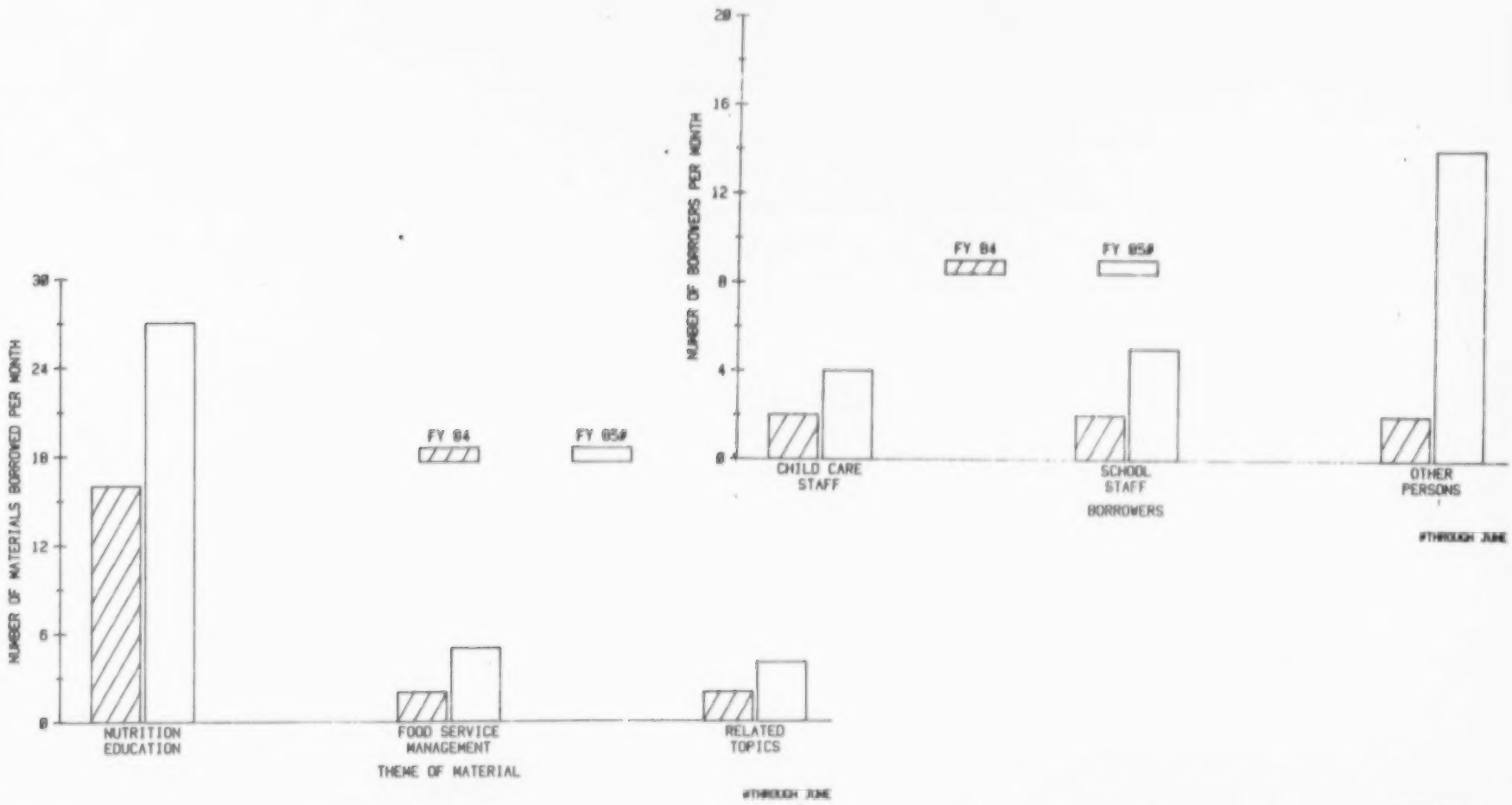
Frequency of borrowing of selected items in the six months before and the six months after the article appeared was the measure used to evaluate the **effects of publicity in a journal article.** The article was one on dental health written by the NET Coordinator and published in the December 1984 issue of the **Texas Child Care Quarterly.** The article included a list of 10 library items that would facilitate dental health learning activities. The frequency of borrowing for these 10 items was compared with that for a set of 10 other items selected at random from the library inventory. If borrowing rates for the ten items cited in the article increased reliably in the six months following publication of the article, the journal article can be judged to be effective library publicity.

To evaluate the **effects of the workshop curricula,** workshop participation was cross-tabulated with library use. Library use was measured as the simple incidence of borrowing at least one item in the period between December 1984 and July 1985. Borrowers were identified by SSN. Data on workshop participation are recorded in workshop registration files for each of the six workshop titles offered through the NET Program. The SSNs of workshop participants between November 1984 and June 1985 were matched with the SSNs for library users. The proportion of workshop participants who also were library users was calculated and matched against a goal of 10 percent. If 10 percent of workshop participants used the library within a few months of their participation, the workshop curricula can be judged to be effective publicity for the library.

Three measures of library use were constructed to evaluate the **effect of the NET media catalog.** The number of borrowers was counted by month from October 1983 through June 1985. The number of library items borrowed also was counted by month. Finally, the number of persons reached by materials borrowed from the library was calculated by month. The data evaluation rules applied to guide this counting are described in Appendix A. Data were analyzed by applying Gottman's procedure for time-series analysis. The mean and standard deviation were calculated for the baseline series October 1983 through December 1984. The obtained values for each month in the post-intervention series January through June 1985 then were compared against a criterion of baseline mean plus two standard deviation values. If all obtained scores in the post-intervention series exceeded criterion, the observed change in borrowing rate can be attributed to publication of the media catalog.

RESULTS

USE OF THE NET LENDING LIBRARY COLLECTION INCREASED DURING FISCAL YEAR 1985.



RESULTS

Use of the NET lending library collection increased during FY 85. The 280 percent increase in number of borrowers surpassed the increase anticipated in the NET State Plan for the year. The number of child care center and public and private school staff using the library more than doubled. Absolute numbers remained small, however. Last year there were about 4 borrowers per month in this primary target group. This year the average is 11 per month.

The major gain in borrowers was in the parents and others group. During FY 84 this group was composed of DHS personnel (about one borrower per month --usually a member of the NET Program staff) and persons identified only as belonging to "other" agencies and functions. During FY 85 the number of borrowers within DHS increased about 500 percent, rising to approximately six borrowers per month. Personnel from licensing and other divisions within the agency as well as members of the NET staff populate the group of library users within DHS. During this fiscal year the library collection has begun to be used by staff nutritionists at hospitals (about three borrowers per month) and by personnel from other government agencies (about two borrowers per month). The number of borrowers in the "other" category increased by 700 percent (about eight borrowers per month--it appears that many of these individuals are teachers and students at Texas colleges and universities).

The number of materials borrowed per month increased by approximately 80 percent. Nutrition education materials continue to be the most popular items. Within this category there was a shift in the borrowing pattern. Before January 1985, approximately two-thirds of the nutrition education materials borrowed were targeted for young children (preschool and early elementary school years). The pattern since January has been a more equal distribution across ages: 30 percent for young ages, 30 per cent for older children (elementary and secondary school grades), and 40 percent for high school and adult students.

Borrowing rates for nutrition education materials for young children have remained relatively constant at approximately 10 items per month (9 per month before January and 11 per month since January). Borrowing rates for materials targeted for older children and adults have increased substantially. The average had been 5 items per month but now is 24 items per month. This change far surpasses the anticipated 150 percent increase.

There has been no change in borrowers' perceptions of the quality of the NET library collection. Borrowers have consistently rated the materials as good or excellent. Ninety-four percent of the materials borrowed have received these high marks.

Effects of a Journal Article

There was a trend toward increased borrowing of selected library items after publication of an article in the Texas Child Care Quarterly.

	Frequency of Borrowing	
Time	Items Cited in the Article (N = 10)	Items Randomly Selected as Control (N = 10)
Before	2	9
After	6	4

Effects of a Journal Article

There was a trend toward increased borrowing of selected library items after publication of an article in the **Texas Child Care Quarterly.** Of 10 items recommended in that article, 2 had been borrowed one time each in the six months preceding appearance of the article. In the six months after appearance of the article, one of the items was borrowed twice, one was borrowed three times, and four others were borrowed one time each for a total of 9 borrowing instances.

This increase is substantial but not statistically significant. When borrowing rates for the items cited in the article were compared with those for a randomly selected control set of 10 library items, the difference was not found to be statistically reliable. In the control set, one item had been borrowed three times and three others had been borrowed once each in the six months preceding appearance of the journal article. After the article appeared, two of the items in the control set were borrowed twice each for a total of 4 borrowing instances. These figures suggest that during any six months period there would be 4 to 6 borrowing instances for any 10 items in the library. The 9 instances observed for the cited items after publication of the journal article is not enough different from the 4 and the 6 to support the conclusion that the journal article caused an increase in borrowing.

Effects of Workshop Curricula

ALTHOUGH WORKSHOP PARTICIPANTS KNOW ABOUT AND HAVE POSITIVE ATTITUDES TOWARD THE COLLECTION, THEY ARE NOT USING IT.

CHARACTERISTICS OF WORKSHOP PARTICIPANTS

> 70% KNOW ABOUT USING THE COLLECTION

> 80% BELIEVE THAT THE LIBRARY IS A USEFUL RESOURCE

< 1% BORROW ITEMS FROM THE COLLECTION

Effects of Workshop Curricula

Although workshop participants know about and have positive attitudes toward the collection, they are not using it. Between November 1984 and May 1985, approximately 1,600 individuals participated in NET workshops. Of this group only 3 used the library at any time in the seven months November 1984 through June 1985.

One of these three was a child care center food service worker who had attended Menu Planning and Nutrition and Preschool Child workshops conducted in May 1985. This individual borrowed two items from the library in June 1985. The other two workshop participant/library users worked as educators in child care centers. One had attended a Nutrition and Preschool Child workshop in March 1985 and borrowed one item from the library in May. The other had attended a Food Early Choices workshop in May but had already borrowed an item from the library in April 1985.

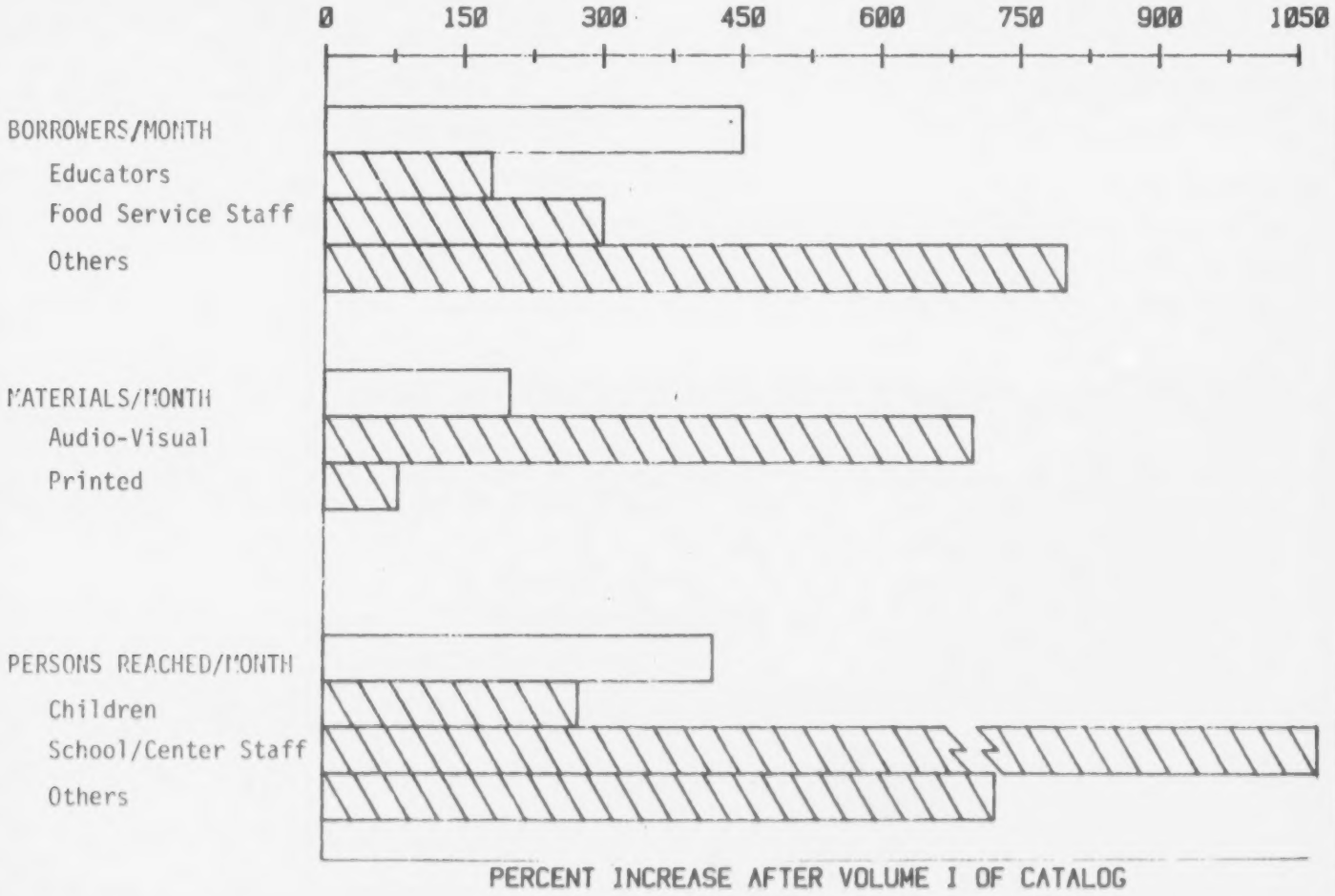
Analysis of data from knowledge tests and attitude scales administered before and after NET workshops showed that, although the curricula had no apparent effect on library borrowing behavior, they were effective in shaping knowledge and attitudes about the library collection. On pretests, 62 percent of workshop participants selected the correct response to an item probing their knowledge about borrowing procedures for the library collection. On a follow-up test administered two months after the workshop, 79 percent selected the correct response.

They also indicated that their attitudes toward the library were more positive after the workshop than they had been before. Eighty-eight percent of the participants reported that they think the library is a useful or very useful resource. Only 68 percent of these individuals reported that they had felt so favorable before the workshop.

Although the majority of workshop participants know about using the library and are persuaded that the collection is a useful resource, they are not using it. They make up only a tiny fraction of the 157 persons who used the library between November 1984 and June 1985. Workshop curricula did not, therefore, having a direct or immediate effect on use of the NET library collection.

Effects of the NET Media Catalog

Borrowing rates increased dramatically after distribution of Volume I of the NET Media Catalog.

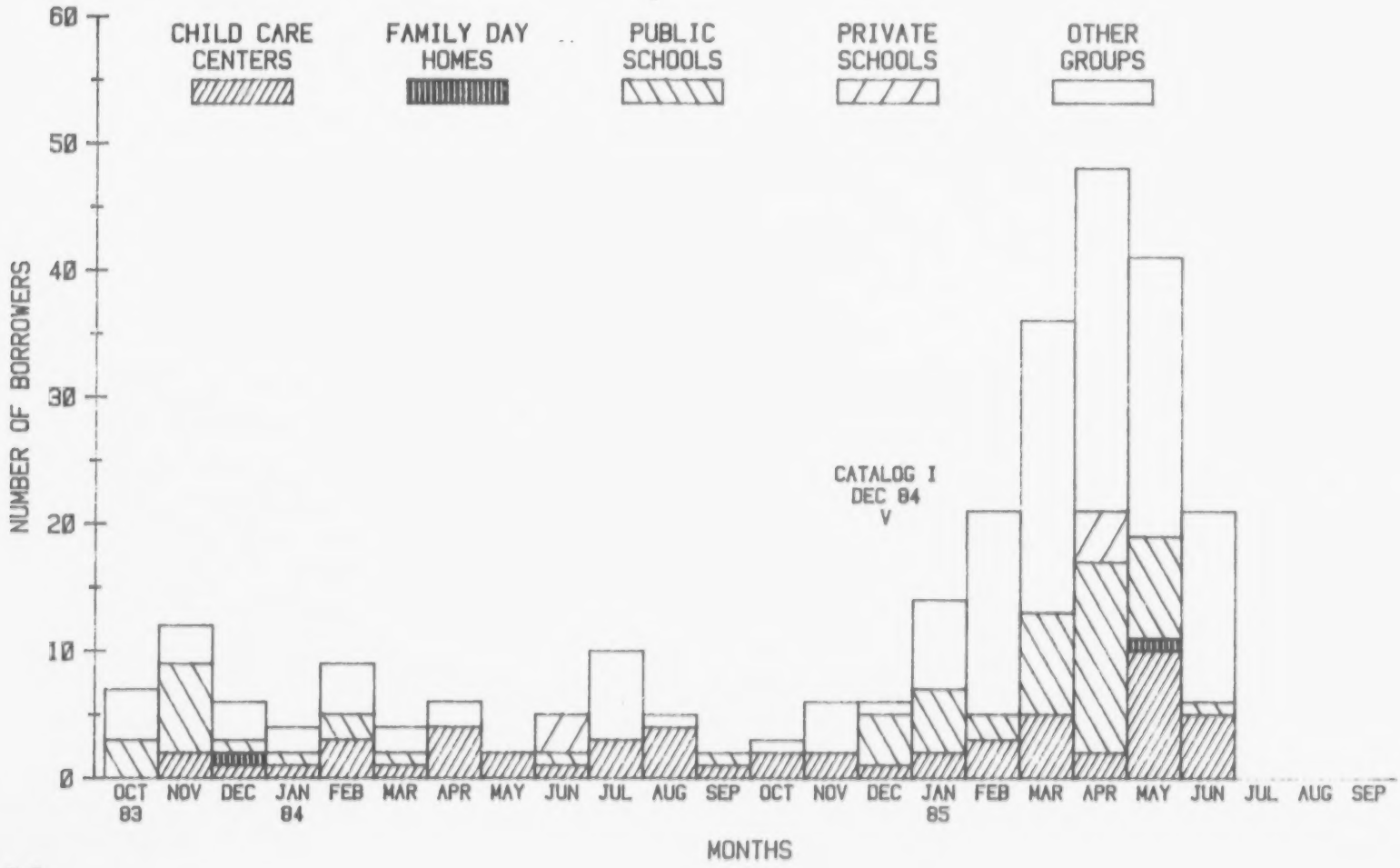


Effects of the NET Media Catalog

Borrowing rates increased dramatically after distribution of volume I of the NET media catalog. Gains were indicated on all three measures of library use. Increases in the number of borrowers and the number of materials borrowed per month already have been discussed using the fiscal year as the event marker for time-series analysis. When the event marker is shifted from September 1984 (the end of FY 84) to December 1984 (the month when the catalog became available), the increase in borrowers per month rises from 280 to 400 percent and the increase in materials borrowed per month rises from 80 to 200 percent. The number of persons reached with materials from the NET lending library collection increased by more than 400 percent after distribution of the catalog.

The most noticeable increases were in the number of child care and school staff reached with library materials, the number of "other" persons using the library collection, and the number of audio-visual materials borrowed. These changes are largely attributable to publication of volume I of the NET Program media catalog.

THE NUMBER OF BORROWERS ROSE FROM AN AVERAGE OF 6 PER MONTH TO 29 PER MONTH.

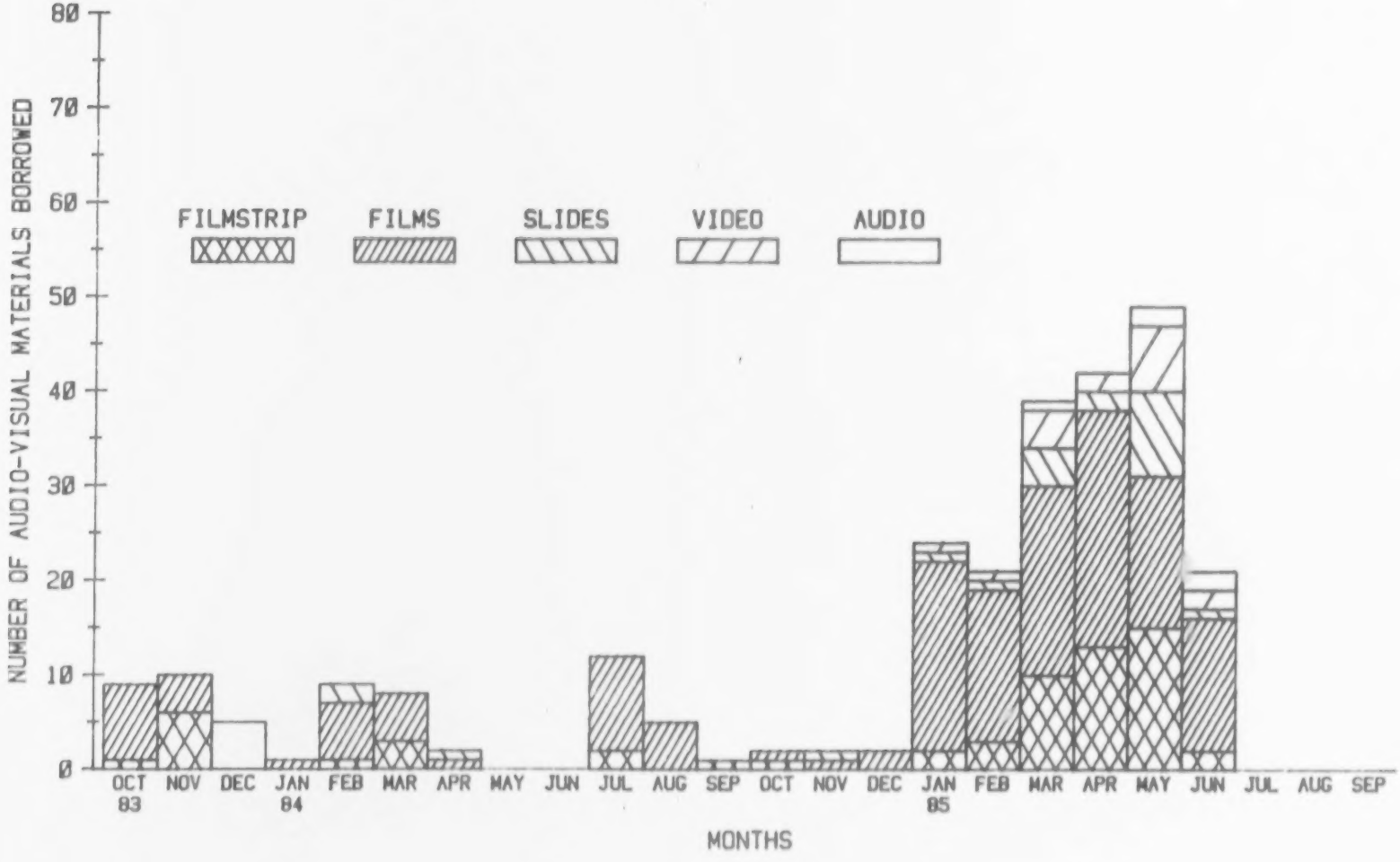


The number of borrowers rose from an average of 6 per month to 29 per month. This increase not only surpassed the criterion value for a 150 percent increase but also met Gottman's criteria for drawing a causal inference. Each month after publication of the catalog, the number of borrowers exceeded a criterion value of the mean plus two standard deviations calculated for the baseline time series October 1983 through December 1984. The mean for the baseline series was 6 with a standard deviation of 3. The criterion value, therefore, was 12(6+3+3). Because the number of borrowers each month from January 1985 through June 1985 exceeded this value, the observed increase in borrowers can be attributed to publication of the NET media catalog.

As has been discussed, the increase in number of borrowers who are staff of child care centers and schools was relatively small. Their numbers increased by 175 percent (rising from 4 to 11 per month), whereas the number of other persons using the library increased by 700 percent (rising from 2 to 18 per month). This differential increase changed the borrowing pattern. Before the catalog was published, two-thirds of the borrowers were from child care centers and schools. After the catalog was published, fewer than half of the borrowers were from this primary target group.

Of the 11 center and school personnel using the library each month, approximately half work in child care centers and half in public schools. Two-thirds of these are educators and one-third are food service personnel. There are very few users who work in private schools. Use of the library by family day home operators is virtually nonexistent.

THE NUMBER OF AUDIO-VISUAL MATERIALS BORROWED INCREASED FROM AN AVERAGE OF 5 PER MONTH TO 30 PER MONTH.

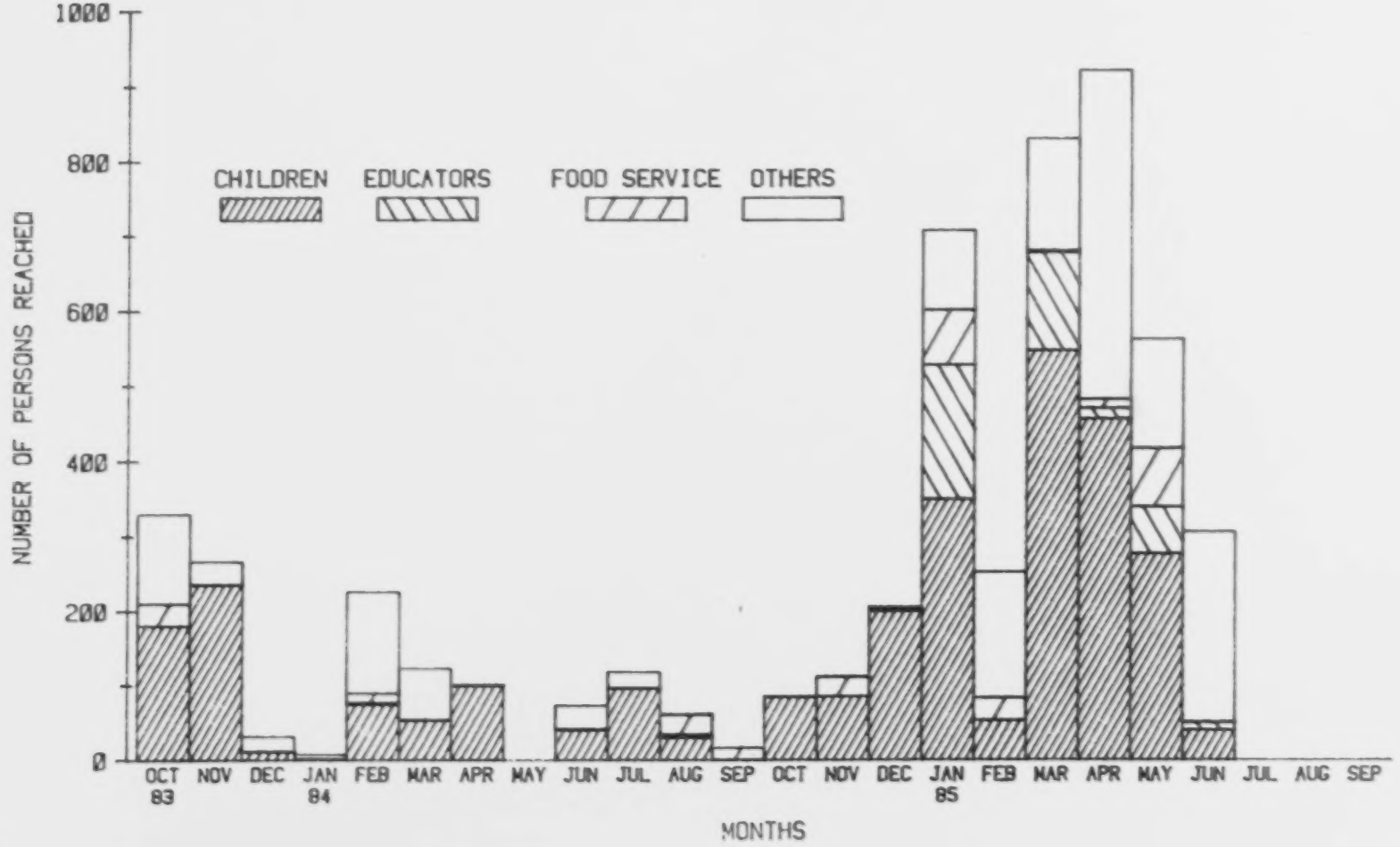


The number of audio-visual materials borrowed increased from an average of 5 per month to 30 per month. In order to achieve the NET Program goal of a 150 percent increase in use, the borrowing rate for audio-visual materials would have to have risen to 8 per month after publication of the catalog. The number of audio-visual items borrowed exceeded this criterion value every month. The average borrowing rate for audio-visual materials between January and June 1985 was 32 items per month.

In order to meet Gottman's criterion for attributing the change in borrowing rates to publication of the catalog, the borrowing rate for audio-visual items would have to have risen to 13. The average for the period October 1983 through December 1984 was 5 per month with a standard deviation of 4. The criterion value is the average plus two standard deviations (5+4+4=13). The number of audio-visual items borrowed exceeded this criterion every month since December of 1984. The change in borrowing rate can be attributed to publication of the catalog.

Borrowing patterns changed after publication of the catalog. Before the audio-visual catalog was published, only about a fourth of the materials borrowed were in the audio-visual media. Since publication of the catalog, more than half of the items borrowed from the library are audio-visual materials. Films continue to be the most popular type of audio-visuals borrowed. Audio resources are borrowed least often, perhaps because the collection of audio resources is very small. The number of video tapes borrowed has risen from zero to an average of three per month. The catalog appears to be promoting use of these relatively expensive items that had not heretofore been used.

THE TREND IS TOWARD AN EXTENDED REACH FOR THE NET LENDING LIBRARY COLLECTION.



The trend is toward an extended reach for the NET lending library collection. The number of persons reached was calculated from information about how the materials were used (item 3 on the data form) and the user's estimate of how many people used or saw the materials (item 4 on the data form). After publication of the NET media catalog, the number of persons reached increased from an average of 110 to 582 per month.

The most noteworthy change was in use of borrowed materials during presentations to school or child care center food service personnel. Before the catalog was published, only two borrowers had reported using items from the collection in this way and both reported making presentations to very small groups of food service staff (3 in one group and 5 in the other). Since December 1984, 13 borrowers reported using NET collection materials in presentations to center or school food service staff in groups averaging about 30 persons. The average number of school or center food service staff reached per month rose from 1 to 66.

Since January 1985, the numbers of children reached per month averaged 234 preschool and early elementary grade school children, 38 children in grades four through eight, and 15 high school students. An average of 33 educators and 211 other adults were reached per month.

The numbers of persons reached from January 1985 through June 1985 varied quite a bit from month to month. There was a noticeable drop in the number of children and educators reached in February. There was also a decline in the number of presentations to children and educators in May and June. This decline is consistent with expectations for the close of the school year. Because of these fluctuations, obtained values did not meet Gottman's criterion for attributing the observed change to the publication of the catalog. However, the number of persons reached each month did exceed the number that represented a 150 percent increase over the number of persons reached each month in FY 84.

DISCUSSION

THE NET MEDIA CATALOG PROVIDED THE MOST EFFECTIVE PUBLICITY FOR THE LENDING LIBRARY COLLECTION.

* PUBLICITY IN A JOURNAL ARTICLE DID NOT HAVE A STATISTICALLY SIGNIFICANT EFFECT ON BORROWING RATES.

* WORKSHOP CURRICULA HAD NO DIRECT EFFECT ON USE OF THE COLLECTION.

* DISTRIBUTION OF THE MEDIA CATALOG PRECIPITATED CHANGES THAT EXCEEDED EXPECTATIONS.

DISCUSSION

The NET media catalog was the most effective publicity for the lending library collection. Although borrowing of items recommended in a journal article increased in the six months after the article appeared, the gain was not statistically significant. The workshop curricula did succeed in informing participants about using the library and persuading them that the library collection is a useful resource for nutrition education and food service training. But the curricula did not have any direct effect on use of the library. Distribution of volume I of the media catalog, on the other hand, precipitated changes in borrowing patterns that exceeded expectations.

It is possible that some of the changes that took place after December 1984 were faciltated by factors other than publication of the media catalog. Because DHS employees did not receive copies of the media catalog, it seems likely that the very satisfying increase in the number of DHS borrowers was spurred by the move into the Winters Center. At the beginning of FY 85 the NET collection was integrated into the DHS library inventory and the entire library moved into a spacious, centrally located library facility in the Winters Center. This move made the library more accessible to employees and visitors to the DHS state office.

Most of the changes in borrowing patterns, however, were large enough and abrupt enough to be easily attributed to publication of the media catalog. Changes in the number of borrowers and in the number of audio-visual materials borrowed were stable enough to enable statistical verification of the inference that they were caused by publication of the catalog.

PUBLICITY STILL IS NEEDED TO ENCOURAGE USE OF THE COLLECTION BY STAFF OF SCHOOLS AND CHILD CARE CENTERS.

* FAMILY DAY HOME OPERATORS ARE PARTICULAR TARGETS OF OPPORTUNITY

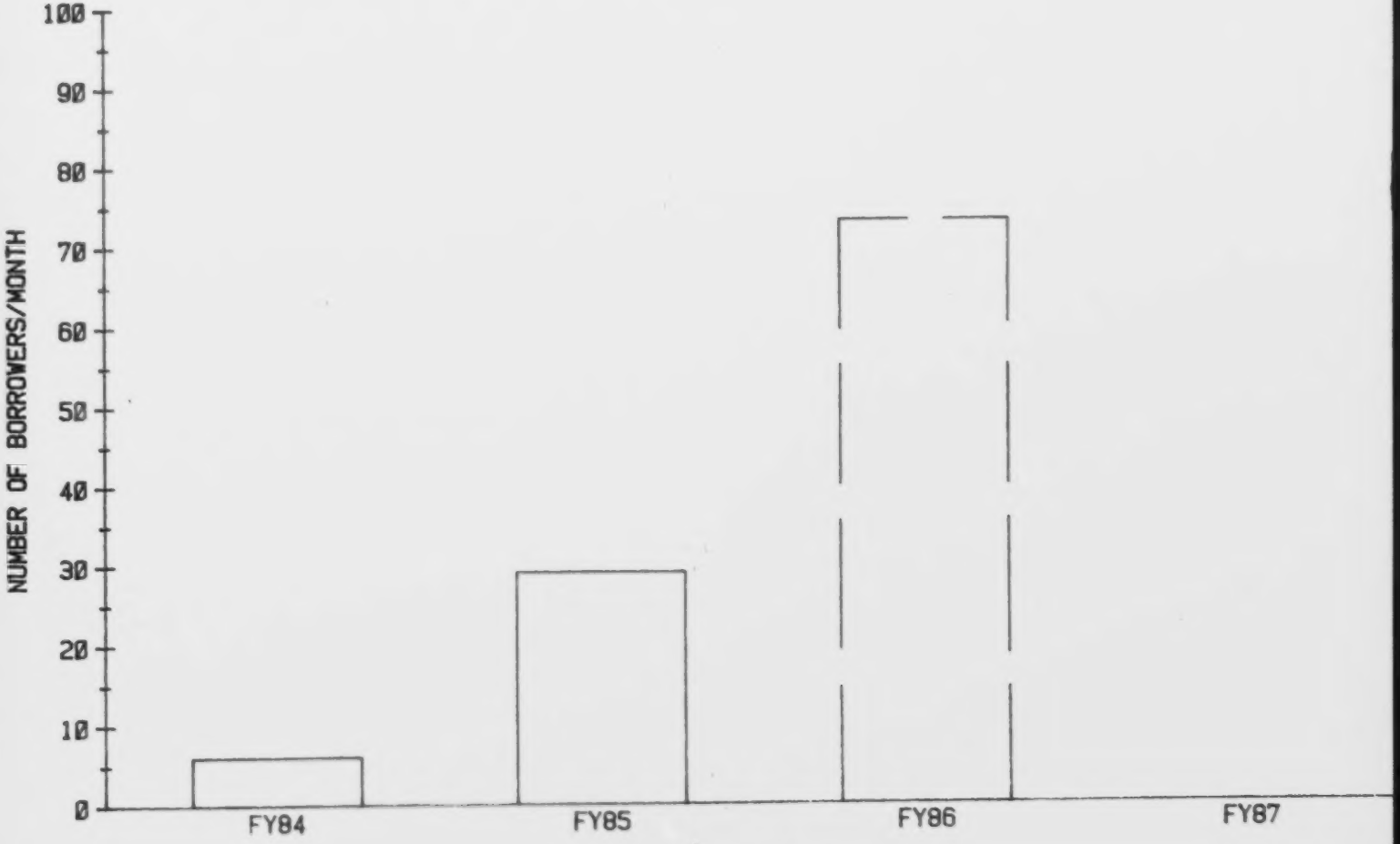
* NET WORKSHOP PARTICIPANTS CONTSTITUTE A MAJOR, UNTAPPED MARKET FOR THE LENDING LIBRARY SERVICES

Publicity still is needed to encourage use of the collection by staff of schools and child care centers. Early issues of the catalog were mailed to persons who participated in or knew about development of the catalog and requested an advance copy. This procedure for distributing the catalog may account for the early jump in the number of users who belong to groups "other" than schools and child care centers. Now that thousands of schools and child care centers have received copies of the catalog, there should be relatively greater increases in the number of school and center staff using the library. Nonetheless, results of this study show that there are easily identifiable groups of child care and school personnel who are good targets for further efforts to publicize the library.

Registered family home operators are particular targets of opportunity. The population of family day home operators is enormous. There are more than 17,000 registered family homes in Texas according to DHS figures for the end of July, 1985. That is twice the number of registered family homes reported in 1980. It seems likely that almost all of the caregivers in these facilities could make good use of materials contained in the NET lending library collection. Yet since October of 1983 there have been only two family home operators who used the library--one in December 1983 and one in May 1985. Clearly, there is a large potential market for NET library services among family home operators.

Another major, untapped market for the lending library services is the population of NET workshop participants. Because the absolute numbers of child care center and school personnel who are library users is small, it was expected that the proportion of workshop participants who actually use the library also would be small. But it was as a surprising finding that the proportion was less than two-thousandths (3/1600). NET workshop participants constitute, therefore, an easily accessible target for further efforts to publicize the library.

ALL THREE PUBLICITY APPROACHES CAN BE USED TO PROMOTE SUSTAINED IMPROVEMENT IN PATTERNS OF LIBRARY USE.



All three publicity approaches can be used to promote sustained improvement in patterns of library use. Even though this study showed that discussing the library in professional publications and in NET workshops had no direct influence on library use, these procedures do provide access to the target populations. Thought now can be given to how to use this access to better effect. Journal articles might have more effect, for example, if they included a tear-out order blank. Likewise, portions of the workshop curricula in which the library is discussed might become more effective if they included an exercise in using the catalog to select and order materials during the workshop. Other means for improving the effectiveness of these two publicity approaches can be developed.

NET Program staff do not expect that the catalog will continually promote increased use of the library. Borrowing rates are expected to decline in July, August, and September because school is out and curriculum plans for school year 1986 have already been made. Borrowing rates are expected to recover in October and remain stable throughout the school year as materials are used to support nutrition education in classrooms.

Publication of volume II is expected to increment use of the library, but the shape of the function can not be projected until it is known when the catalog will reach users. The effect will be different if it arrives early in the fall than will be the case if it arrives later in the school year. The media catalogs will continue to be effective only so long as they are used. Any bound volume has a way of "disappearing" after a time--it moves away with the person who orignally had charge of it or it gets shelved in the wrong location or it simply gets out of sight and therefore out of mind. Continued monitoring and appropriate followup action will help to ensure that the catalog continues to promote use of the NET library collection as a nutrition learning resource.

Assuming that volume II of the catalog will have a facilitating effect on use of the library and assuming that more effective publicity for the library is integrated into NET workshops, it can be projected that library use will increase by at least 150 percent during FY 86. Additional increases in subsequent years will depend on the nature and intensity of continuing publicity.

APPENDIX A

Data Evaluation Rules: To count the number of persons reached

1. Identify training events:

Each library item borrowed equals one case in the "raw data" list. Sort the list by the borrower's SSN and date the item was borrowed. Delete all cases in which the response to item 4 is coded "50" (item was checked out but not reviewed or used").

A training event is a set of cases in which the SSN, date, and responses to items 1, 2, 3, and 4 are identical. A set may contain as few as 1 case and as many as 10-20 cases.

2. Calculate the number of children reached:

a. For those training events in which item 1 is **not** coded "2" or "3" and item 3 is coded "32", "33", "34", or "35", count all of the number reported in response to item 4 as "public school children reached."

b. For those training events in which item 1 is coded "2" or "3" and item 3 is coded "32", "33", "34", or "35", count all of the number reported in response to item 4 as "private school children reached."

c. For those training events in which item 3 is coded "31" (irrespective of the response to item 1), count all of the number reported in response to item 4 as "child care institution children-reached."

3. Calculate the number of educators reached:

a. For those training events in which item 1 is coded "1" and item 3 is coded "36", count all of the number reported in response to item 4 as "public school educators." Also count events in which item 2 is coded "1" or "4" (irrespective of the response to item 3)--these, too, are "public school educators." For those training events in which item 1 is **not** coded "1", "2", or "3" but item 3 is coded "36", count all of the number reported in response to item 4 as "public school eduators." The sum of these three types of counting equals the number of public school educators receiving training.

b. For those training events in which item 1 is coded "2" and item 3 is coded "36" count all of the number reported in response to item 4 as "private school educators." Also count events in which item 1 is coded "1" and item 2 is coded "1" or"4" (irrespective of the response to item 3)--these, too, are "private school educators." The sum of these two types of counting equals the number of private school educators receiving training.

c. For those training events in which item 1 is coded "3" and item 3 is coded "36", count all of the number reported in response to item 4 as "child care institution educators." Also count events in which item 1 is coded "3" and item 2 is coded "1" or "4" (irrespective of the response to item 3)--these, too, are "child care institution educators." The sum of these two types of counting equals the number of child care institution educators receiving training.

4. Calculate the number of food service personnel reached:

a. For those training events in which item 1 is coded "1" and item 3 is coded "37", count all of the number reported in response to item 4 as "food service personnel." Also count those events in which item 1 is coded "1" and item 2 is coded "2", "3", or "5" as "food service personnel." The sum of these two types of counting equals the number of public school food service personnel receiving training.

b. For those training events in which item 1 is coded "2" and item 3 is coded "37", count all of the number reported in response to item 4 as "food service personnel." Also count those events in which item 1 is coded "2" and item 2 is coded "2", "3", or "5" as "food service personnel." The sum of these two types of counting equals the number of private school food service personnel receiving training.

c. For those training events in which item 1 is coded "3" and item 3 is coded "37", count all of the number reported in response to item 4 as "food service personnel." Also count those events in which item 1 is coded "3" and item 2 is coded "2", "3", or "5" as "food service personnel." The sum of these two types of counting equals the number of child care institution food service personnel receiving training.

5. Calculate the number of parents and others reached:

For those training events in which item 3 is coded "38" or "39", count all of the number reported in

response to item 4 as "parents and guardians". Also count those events in which item 1 is not coded "1", "2", "3", or "4" as "parents and guardians". The sum of these two types of counting equals the number of parents and guardians receiving training.

APPENDIX F

EVALUATION REPORT

USE OF NUTRITION EDUCATION AND TRAINING MATERIALS

JANUARY THROUGH AUGUST 1985

EXECUTIVE SUMMARY

MATERIALS DISTRIBUTED BY THE TEXAS NUTRITION EDUCATION AND TRAINING (NET) PROGRAM HAVE ACHIEVED ACCEPTABLE LEVELS OF USE, ALTHOUGH CERTAIN CHANGES WOULD MAKE THEM MORE USEFUL.

	PERCENT USING	HOW OFTEN USED	CHANGE IN CONTENT	CHANGE IN FORMAT	CHANGE IN DISTRIBUTION	CHANGE IN TRANSLATION
FOOD...EARLY CHOICES KIT	72	A FEW TIMES	+	-	+	0
ECONOMY IN THE KITCHEN	73	A FEW TIMES	+	_	+	-
MORE THAN GRAHAM CRACKERS	62	MANY TIMES	-	+	-	0
FOOD IS GOOD SERIES	64	A FEW TIMES	0	-	-	+
THE VERY HUNGRY CATERPILLAR	67	MANY TIMES	+	+	+	0

KEY: + = NO CHANGE NEEDED - = CHANGE NEEDED 0 = NOT APPLICABLE

EXECUTIVE SUMMARY

Materials distributed by the Texas Nutrition Education and Training (NET) program have achieved acceptable levels of use, although certain changes would make them more useful. Distributing nutrition education and food service materials to child care centers and schools is one way in which the NET Program seeks to reach all children in the state with opportunities to learn and practice good eating habits. The **Food...Early Choices** kit, the set of booklets in the **Food is Good** series, the cookbook entitled **More Than Graham Crackers**, and the book entitled **The Very Hungry Caterpillar** are mailed to centers and schools that participate in NET workshops. **Economy in the Kitchen** is a booklet that individuals receive during their participation in one of the workshops.

This study was conducted to determine how often the materials are used and what changes in the content, format, distribution, and translation of the materials would increase their use and utility. A questionnaire inquiring about frequency of use and suggested changes in the materials was mailed to a sample of workshop participants approximately two months after workshops were conducted. This information is needed to help make decisions about how to make the materials as effective as possible in reaching the children.

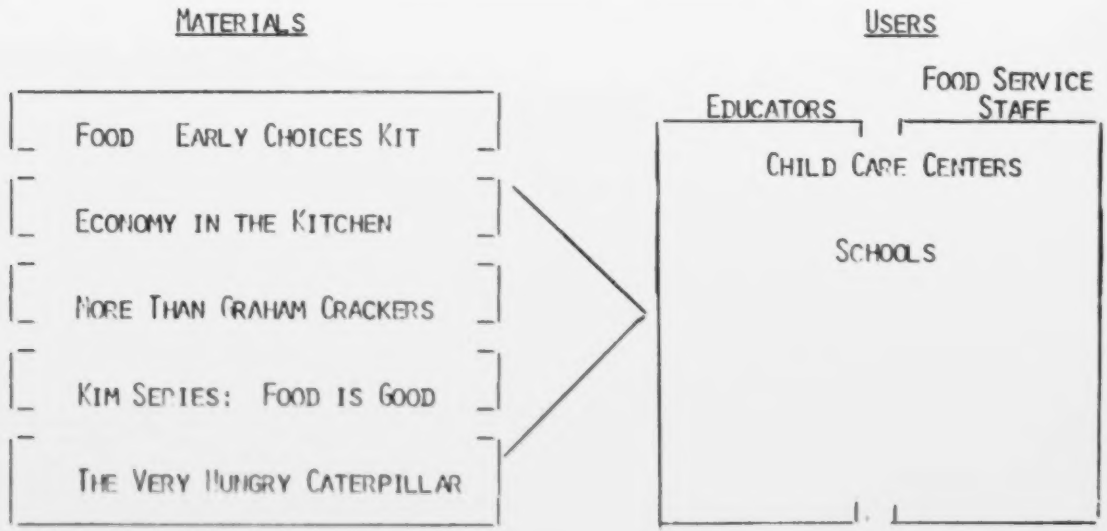
Each one of the five materials investigated was being used by the majority of the workshop participants who reported that their center had received the material. Most of the participants who used the materials used them more than once. Although infrequent users of the materials often recommended changes in the materials, they were not able to identify what specific changes were needed. Frequent users were able to specify needed changes. They recommended including more games in the **Food...Early Choices** kit, simplifying **Economy in the Kitchen**, including more information on cooking with children in **More than Graham Crackers**, and adding colored pictures to the **Food is Good** series.

More than Graham Crackers and the **Food is Good** series experienced problems in distribution. It is suggested that the packaging of these materials may need to be changed to prevent them from getting lost.

Results on the use of the Spanish translations were inconsistent. The Spanish version of the **Food is Good** series was used by an acceptable number of respondents, but the translation of **Economy in the Kitchen** was used infrequently. Because all of the questionnaires were written in English, it is possible that Spanish speaking workshop participants were under represented in this study. Such under representation might explain the low level of use report for materials written in Spanish.

BACKGROUND

THE NUTRITION EDUCATION AND TRAINING (NET) PROGRAM PURCHASES AND DISTRIBUTES MATERIALS TO SUPPORT FOOD SERVICE AND NUTRITION EDUCATION ACTIVITIES IN CHILD CARE CENTERS AND SCHOOLS.



BACKGROUND

The Nutrition Education and Training (NET) Program purchases and distributes materials to support food service and nutrition education activities in child care centers and schools. The provision of these materials is one way in which the Texas NET program approaches the federally stipulated goal of ensuring that all children have opportunities to learn and practice good eating habits.

The materials are distributed to non-profit child care centers contingent on participation in NET workshops. All of the materials serve the purpose of encouraging and facilitating transfer of learning from the workshop to the work place. They help to assure that the workshop participants can apply the food service and nutrition education knowledge and skills they acquire in the workshop.

The Food...Early Choices kit is a collection of preschool nutrition education materials including lesson plans, activity ideas, games, and a puppet. The kit is published by the National Dairy Council and mailed to child care centers represented in the Food...Early Choices workshops.

Economy in the Kitchen is a booklet published by the Texas Department of Human Services. It includes information about economical menu planning, food purchasing, and food preparation. The booklet is included in the folder given to each individual participating in the Menu Planning and Kitchen Economy and in the Off to a Good Start workshops.

More than Graham Crackers is a book of recipes and cooking activities for children. It is published by the National Association for the Education of Young Children. The book is mailed to child care centers represented in the Menu Planning and Kitchen Economy and in the Nutrition and the Preschool Child workshops.

The Kim Series: Food is Good is a series of children's booklets published by the Yakima Home Economics Association in Yakima, Washington. The booklets, which provide information about nutrition and health, are mailed to child care centers represented in the Nutrition and the Preschool Child workshops.

The Very Hungry Caterpillar is a children's book used to teach about eating different kinds of foods. The book is mailed to child care centers represented in the Nutrition and the Preschool Child workshops.

A SAMPLE OF NET WORKSHOP PARTICIPANTS WAS SURVEYED TO DETERMINE HOW OFTEN THE MATERIALS ARE USED AND TO IDENTIFY CHANGES THAT CAN BE MADE TO ENHANCE THEIR USE AND UTILITY.

- ARE THE MATERIALS BEING USED?

- WHAT CHANGES IN DISTRIBUTION, CONTENT, FORMAT, AND/OR TRANSLATIONS CAN BE MADE TO INCREASE USE OF SPECIFIC MATERIALS?

A sample of NET workshop participants was surveyed to determine how often the materials are used and to identify changes that can be made to increase their use and utility. Information about how many participants use the materials and how frequently materials are used assists NET program staff in deciding whether to continue distributing the materials. Participants' suggestions about needed changes in the content and format of the materials enable NET program staff to change the materials to make them more useful or substitute other materials that better meet the needs of participants. Information about how many workshop participants receive the materials is used to evaluate distribution procedures.

Since the costs of translating the materials into Spanish is high, the study solicited information about how often these translations are used. NET program staff requested this information to decide if sufficient numbers of workshop participants are using the two Spanish versions to justify the cost of translating other materials.

PROCEDURES

A QUESTIONNAIRE MAILED TO NET WORKSHOP PARTICIPANTS TWO MONTHS AFTER WORKSHOP ATTENDANCE PROVIDED DATA ON USE OF AND SUGGESTED CHANGES IN THE MATERIALS.

Section II

These questions are about the materials you may have received from the NET program. For each question, please CIRCLE the number next to the answer which you choose. We want to know what you think about these materials.

1. Have you ever used **ECONOMY IN THE KITCHEN**—white book with brown illustrations produced by the Texas NET program?

   1 I have never received this material ——→ Please skip to the top of page 5
   2 No ——→ Please skip to the top of page 5.
   3 Yes ——→ Please continue

   A. How often have you used this material?

      1 once
      2 a few times
      3 many times
      4 weekly or more often

   B. Do you use the English or Spanish version?

      1 English
      2 Spanish
      3 both

   C. What one change in the content of this material would make it more useful?

      1 more on menu planning and purchasing
      2 more on saving money
      3 more on preparing food
      4 more recipes
      5 other _____
      6 it's fine as is

   D. What one change in the format of this material would make it more useful?

      1 needs to be shorter
      2 needs to be longer
      3 needs to be easier
      4 needs to be harder
      5 other _____
      6 it's fine as is

PROCEDURES

A questionnaire mailed to NET workshop participants two months after workshop attendance provided data on the use of and needed changes in the materials. Questions about two of the materials were included in the questionnaire for each workshop.

The multiple choice questions asked if the center had received the materials and, if so, how often they were used, whether the English or Spanish versions were used, and what changes in the content and format of the materials would make them more useful. Workshop participants who reported using the children's books provided by the NET workshops were asked to rate the children's level of interest in the books. Those participants who used **The Very Hungry Caterpillar**, a commercially published book, were asked what they would use if the NET program did not distribute this book--a different book or the same book acquired from another source.

DESCRIPTIVE STATISTICS WERE CALCULATED IN ORDER TO COMPARE REPORTED FREQUENCY OF USE AGAINST CRITERIA FOR ACCEPTABLE LEVELS OF USE AND TO IDENTIFY KEYS TO INCREASED USE.

* TO EVALUATE USE OF THE MATERIALS, ACTUAL PRECENTAGE OF USE WAS COMPARED AGAINST CRITERION.

* TO IDENTIFY KEYS TO INCREASED USE OF THE MATERIALS, RESPONSES TO QUESTIONS ABOUT DESCRIBED CHANGES WERE TABULATED AND EXAMINED.

Descriptive statistics were calculated in order to compare reported frequency of use against criteria for acceptable levels of use and to identify keys to increased use. Percentages and in some cases averages were computed for the items on the questionnaire. A set of decision rules was developed to evaluate the results. These criteria were developed in coordination with NET program staff, who determined acceptable levels of use and satisfaction with the materials.

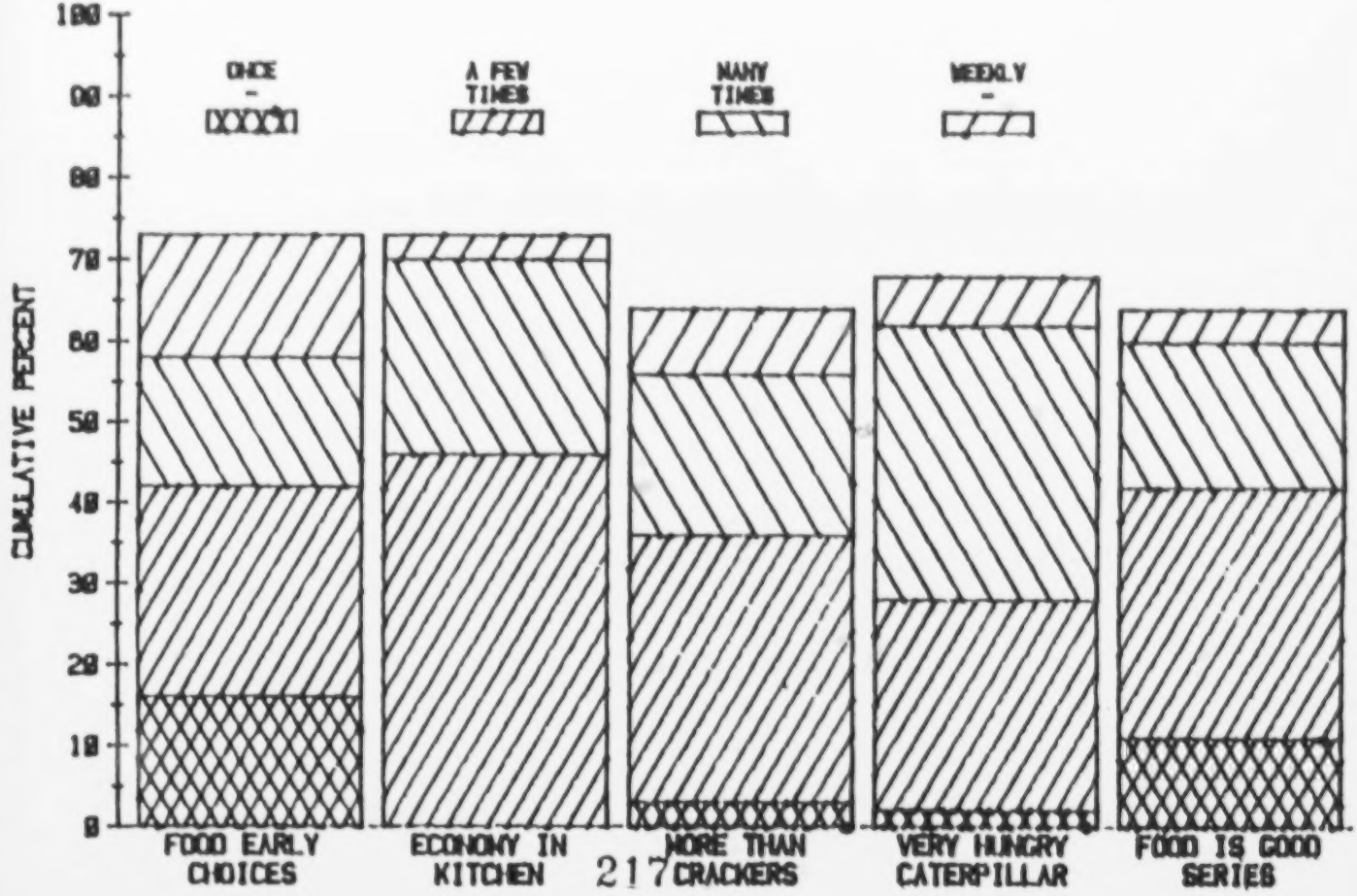
The criterion for the acceptable level of use of the materials was applied to the group of respondents who reported receiving the materials. Sixty percent was determined to be an acceptable level of use, and 75 percent was considered to be very good. If more than 25 percent of the workshop participants indicated they did not receive a particular book or kit, it was concluded that the distribution of that item needed to be evaluated further. The ideal frequency with which workshop participants use the materials was set at "many times" (a value of 3 on a 4-point scale).

Criteria for determining if changes are needed in the content or format of the materials were applied to the set of responses from workshop participants who reported using the materials. If 40 percent of the participants who used the material recommended a particular change, it was concluded that there may be a defect in the material that could be corrected by changing or replacing it. If 60 percent or more responded that no changes are necessary, the material was judged to be satisfactory. The ideal level of children's interest in the children's books was set at "very interested" (1 on a 3 point scale), but "somewhat interested" (2 on the scale) was acceptable. Regarding the book **The Very Hungry Caterpillar**, if more than 60 percent of the workshop participants who used this book replied they would use the same book obtained from another source, it was to be concluded that they would not recommend replacing the book.

The criterion for the acceptable level of use of Spanish translations was applied to responses from the entire group of respondents. In order to make the translations cost effective, at least 10 percent of the workshop participants should use them. Ideally 20 percent of the workshop participants will use the Spanish translation.

RESULTS

ALL OF THE MATERIALS WERE USED BY MORE THAN 60 PERCENT OF THE RESPONDENTS WHO RECEIVED THEM.



RESULTS

All of the materials were used by more than 60 percent of the respondents who received them. **Economy in the Kitchen** was used by 73 percent of the respondents, which is very close to the ideal level of 75 percent. The percentage of respondents using the other materials are: The **Food...Early Choices** kit, 72 percent; **More than Graham Crackers**, 62 percent; **The Very Hungry Caterpillar**, 69 percent; and the **Food is Good** series, 64 percent.

The workshop participants who reported using the materials used them frequently. A very large proportion of the respondents (78 to 100 percent; average=92 percent) used the materials more than once, a good indication they found the materials helpful. When the average responses to the question on frequency of use are rounded off to the nearest integer, **The Very Hungry Caterpillar** and **More than Graham Crackers** reach the criterion for ideal frequency of use (many times). The average response for the other materials was a few times.

The return rate of questionnaires from the Food...Early Choices workshop was high enough to assume the sample is representative of all workshop participants. Questionnaires were mailed to 133 Food...Early Choices workshop participants and 48 were returned. Slightly fewer surveys were returned from the other two workshops, so it is less certain that these samples are representative. For the Nutrition and the Preschool Child workshops, 120 surveys were mailed and 44 were returned. Eighty-seven Menu Planning and Kitchen Economy surveys were mailed, and 42 were returned.

FOOD...EARLY CHOICES KIT

THE FOOD...EARLY CHOICES KIT APPEARS TO BE WELL RECEIVED BY WORKSHOP PARTICIPANTS, ALTHOUGH MANY OF THEM SUGGESTED CHANGES IN CONTENT AND FORMAT OF THE KIT.

	CONTENT CHANGES	FORMAT CHANGES	AGREED UPON CONTENT CHANGES	AGREED UPON FORMAT CHANGES
FREQUENT USERS N=14	8	10	NONE	MORE GAMES (6)
INFREQUENT USERS N=18	10	8	NONE	NONE

NEVER RECEIVED MATERIALS N=5

FOOD...EARLY CHOICES KIT

The **Food...Early Choices** kit appears to be well received by workshop participants, although many of them suggested changes in the content and format of the kit. Of the participants who received the kit, 73 percent used it, and the average response for frequency of use was "a few times." Many of the participants who used the kit (78 percent) used it more than once.

A large number of the workshop participants who used the **Food...Early Choices** kit recommended changes in its content and format. Less than 60 percent responded that the kit's content and format are satisfactory. When the group of users was viewed together, there was no consensus on how the kit should be changed; there is no change that at least 40 percent of the participants requested. However, when the data were cross tabulated with frequency of use there was some consensus among those who used the materials frequently. There was still no consensus on content change items, although the content change most frequently suggested by both groups is adding more information on trying new foods. On format change items there was no agreement on needed changes among those who reported using the the kit once or a few times, although the suggestion most frequently made by this groups is adding more lesson ideas. Of those who used the kit more than a few times, 46 percent suggested adding more games.

Since only 10 percent of the workshop participants indicated they did not receive the **Food...Early Choices** kit, it appears that the distribution of the material is adequate. The Spanish translation of the kit is not available yet, although it is being prepared for distribution.

ECONOMY IN THE KITCHEN

ALTHOUGH RESPONDENTS INDICATED THAT CHANGES WERE NEEDED IN CONTENT AND FORMAT, ECONOMY IN THE KITCHEN IS BEING USED BY A HIGH PERCENTAGE OF WORKSHOP PARTICIPANTS.

	USED SPANISH TRANSLATION	CONTENT CHANGES	FORMAT CHANGES	AGREED UPON CONTENT CHANGES	AGREED UPON FORMAT CHANGES
FREQUENT USERS N=10	1	8	6	NONE	NEEDS TO BE EASIER
INFREQUENT USERS N=17	1	10	4	NONE	NONE

RECEIVED MATERIALS BUT DID NOT USE, N=10 NEVER RECEIVED MATERIALS, N=6

ECONOMY IN THE KITCHEN

Although respondents indicated that changes are needed in content and format, **Economy in the Kitchen** is being used by a high percentage of workshop participants. Seventy-three percent of the participants who received the book used it. On the average it was used "a few times." All of the respondents who used **Economy in the Kitchen** used it more than once.

When the entire group of respondents who used this book was considered, no single change in content or format predominated. The changes in content that were suggested most frequently are including more recipes (28 percent), more information on menu planning and purchasing (24 percent), and more information on preparing food (20 percent). When the group was divided by frequency of use there was still no change in content suggested by more than 40 percent of the participants. For changes in format there was a difference when the group was divided. Although 60 percent of the group as a whole said that no changes need to be made, most of these participants used the material once or a few times. Sixty percent of the frequent users responded that format changes should be made. A substantial number of the respondents in this group (44 percent) suggested that the book should be easier.

Of the total number (100 percent) of respondents, 5 percent used the Spanish version of this book. This is below the criterion value that the program staff identified as an acceptable level of use. Of the respondents who reported actually using the book, 8 percent used the Spanish version.

Since a low percentage of the respondents (12 percent) reported that they did not receive **Economy in the Kitchen**, the distribution method presently used for this book appears adequate.

MORE THAN GRAHAM CRACKERS APPEARS TO BE FAIRLY WELL RECEIVED, ALTHOUGH CHANGES IN ITS CONTENT AND DISTRIBUTION COULD INCREASE USE.

	CONTENT CHANGES	FORMAT CHANGES	AGREED UPON CONTENT CHANGE	AGREED UPON FORMAT CHANGE
FREQUENT USERS N=7	4	2	MORE ON COOKING WITH CHILDREN	NONE
INFREQUENT USERS N=8	3	1	NONE	NONE

RECEIVED MATERIALS BUT DID NOT USE, N=10
USED BUT DID NOT SPECIFY FREQUENCY, N=1

NEVER RECEIVED MATERIALS, N=15

MORE THAN GRAHAM CRACKERS

More than Graham Crackers appears to be fairly well received and frequently used, although changes in its content and distribution could increase its use. Of the Nutrition and the Preschool Child workshop participants who received the book, 62 percent reported using it. The average frequency of use was "many times," which is considered the ideal frequency. All respondents who used the book used it more than once.

There is no change in content that was suggested by at least 40 percent of the respondents when the responses of the group were tabulated collectively. When the group was divided by frequency of use into respondents who used the book once or a few times and those who used it more often, there were interesting differences. Of the group that used the book infrequently, 63 percent replied that no changes are needed. Of those who used the book more frequently, 57 percent said changes should be made in the content of **More than Graham Crackers**. A large proportion of the frequent users (43 percent) suggested that it should include more information on cooking with children.

There were eight questionnaire respondents (37 percent) who reported that they did not receive **More than Graham Crackers**. This exceeds the criterion for acceptability, which is 25 percent or less. It also is higher than the proportion of participants not receiving the **Food...Early Choices** kit or **The Very Hungry Caterpillar**, which also are mailed to workshop participants. In fact, these materials often are mailed together. It may be that **More than Graham Crackers**, because of its small size, is more frequently lost after it arrives at the center.

FOOD IS GOOD SERIES

THE FOOD IS GOOD SERIES WAS USED BY A FAIR NUMBER OF NUTRITION AND THE PRESCHOOL CHILD WORKSHOP PARTICIPANTS, BUT ITS USE COULD BE INCREASED IF DISTRIBUTION WERE IMPROVED.

	USED SPANISH TRANSLATION	CHILDREN ARE VERY INTERESTED	FORMAT CHANGES	SIGNIFICANT FORMAT CHANGE
FREQUENT USERS N=6	2	5	3	ADD COLORED PICTURES
INFREQUENT USERS N=11	4	4	3	NONE

RECEIVED MATERIALS BUT DID NOT USE, N=10
NEVER RECEIVED MATERIALS, N=13
USED BUT DID NOT SPECIFY FREQUENCY, N=1

FOOD IS GOOD SERIES

The Food is Good series was used by a fair number of Nutrition and the Preschool Child workshop participants, but its use could be increased if distribution were improved. The series was used by 64 percent of the respondents who received it. The average frequency of use was "a few times." Of those who used the series, 88 percent used it more than once.

Half of the respondents who used the series reported that the children were very interested in these books. Not surprisingly, a higher percentage of the frequent users said that the children were very interested in the series (83 percent).

Over a third (35 percent) of the respondents who used the series indicated that changes in the format of the books are needed. When the respondents were divided into those who used the books once or a few times and those who used the series more frequently, there were some interesting results. The group that used the books less frequently appeared to be satisfied with them, but in the group that used the books more often, 60 percent said the books need more colored pictures.

Over 30 percent of the questionnaire respondents reported that they did not receive the **Food is Good** series. This exceeds the criterion for acceptability, which is 25 percent or less. The percentage of respondents not receiving the series was higher than that for two other mailed materials, the **Food...Early Choices** kit and **The Very Hungry Caterpillar**. The results are similar to those for the book **More than Graham Crackers**. As with **More than Graham Crackers**, the book's small size may result in its getting lost more frequently after it reaches the centers.

The Spanish translation of the series is well used. Of those who reported receiving and using the series, 6 percent used the Spanish translation only and 28 percent used both the Spanish and English versions.

THE VERY HUNGRY CATERPILLAR

THE VERY HUNGRY CATERPILLAR IS A POPULAR BOOK WITH BOTH THE TEACHERS WHO RECEIVED IT AND THE CHILDREN WITH WHOM IT WAS USED.

	CHILDREN ARE VERY INTERESTED	WOULD USE THIS BOOK
FREQUENT USERS N=14	14	10
INFREQUENT USERS N=10	7	5

RECEIVED MATERIALS BUT DID NOT USE, N=11
NEVER RECEIVED MATERIALS, N=8

THE VERY HUNGRY CATERPILLAR

The Very Hungry Caterpillar is a popular book with both the teachers who received it and the children with whom it was used. Of those respondents who received the book, 67 percent reported using it. Nearly all of the users of the book (96 percent) used it more than once. It was used an average of "many times," which met the criterion for ideal frequency of use.

The respondents' satisfaction with the book is reflected in their answers to the question about what they would use in place of this book if it were not distributed by the NET program. Of the respondents who used the book, 30 percent answered they would use the same book purchased by the child care center. Another 30 percent responded they would borrow the book from the NET library or some other library, and 4 percent said they would buy the book and use it in their class. Some of the respondents (26 percent) said they would use another book and a small number (8 percent) would not use anything in its place.

According to the respondents, the children liked **The Very Hungry Caterpillar** a great deal. Of the respondents who used the book, 88 percent reported that the children were very interested in the book. As might be expected, all of the frequent users said the children are very interested.

A small percentage (19 percent) of the respondents said they did not receive the book. This meets the criterion for acceptablilty, so the distribution method does not need to be changed at this time.

DISCUSSION

ALTHOUGH ALL MATERIALS EVALUATED ARE WELL RECEIVED AND USEFUL TO PARTICIPANTS, SOME CHANGES WOULD IMPROVE THEIR UTILITY.

DISTRIBUTION OF MORE THAN GRAHAM CRACKERS AND THE FOOD IS GOOD SERIES SHOULD BE CHANGED TO ENSURE THEY ARE NOT LOST WHEN THEY REACH THE CENTERS.

CHANGES IN THE CONTENT AND FORMAT WERE SUGGESTED BY THE FREQUENT USERS OF THE MATERIALS.

- INCLUDE MORE GAMES IN THE FOOD...EARLY CHOICES KIT.
- SIMPLIFY ECONOMY IN THE KITCHEN.
- INCLUDE MORE INFORMATION ON COOKING WITH CHILDREN IN MORE THAN GRAHAM CRACKERS.
- ADD COLORED PICTURES TO THE FOOD IS GOOD SERIES.

DATA PROVIDED MIXED INFORMATION REGARDING THE USEFULNESS OF SPANISH TRANSLATIONS.

DISCUSSION

Although all of the materials evaluated are well received and useful to workshop participants, some changes would improve their rate of use and make them more helpful. The materials distributed in the Menu Planning and Kitchen Economy workshop are particularly well used. **Economy in the Kitchen** was used by the largest percentage of respondents and **More than Graham Crackers** was used most frequently. All the respondents from this workshop using these materials reported using them more than once.

Questioning workshop participants about changes needed in the content and format of the materials provided interesting information. Although respondents readily suggested changes there was rarely consensus on which changes should be made. This would seem to indicate that any deficiencies participants found in the materials are not particularly important. However, since there was consensus on some needed changes among the frequent users of the materials, continued use may enable the participants to better identify needed changes. In future evaluations of the materials, perhaps questionnaires could be sent after the workshop participants have had a chance to use the materials more often.

Two of the materials, **More than Graham Crackers** and the **Food is Good** series, experienced problems in distribution. As these materials are usually mailed with other materials, they should be received at the same rate, but this is not the case. One explanation is that because these books are smaller than the other materials they are more easily lost shortly after arrival. It may be necessary to change the packaging of these books so they are more noticeable and less likely to get lost.

The data show that the Spanish translation of **Economy in the Kitchen** is under used. This indicates an apparent lack of need for the translation of this material, but this result may be misleading. Because all questionnaires were in English it is likely that Spanish speaking workshop participants who would use the translated material are under-represented in the sample of respondents. Future evaluation with bilingual questionnaires or interviews may determine whether there is really under-utilization of this translation or whether this result is due to sampling bias.